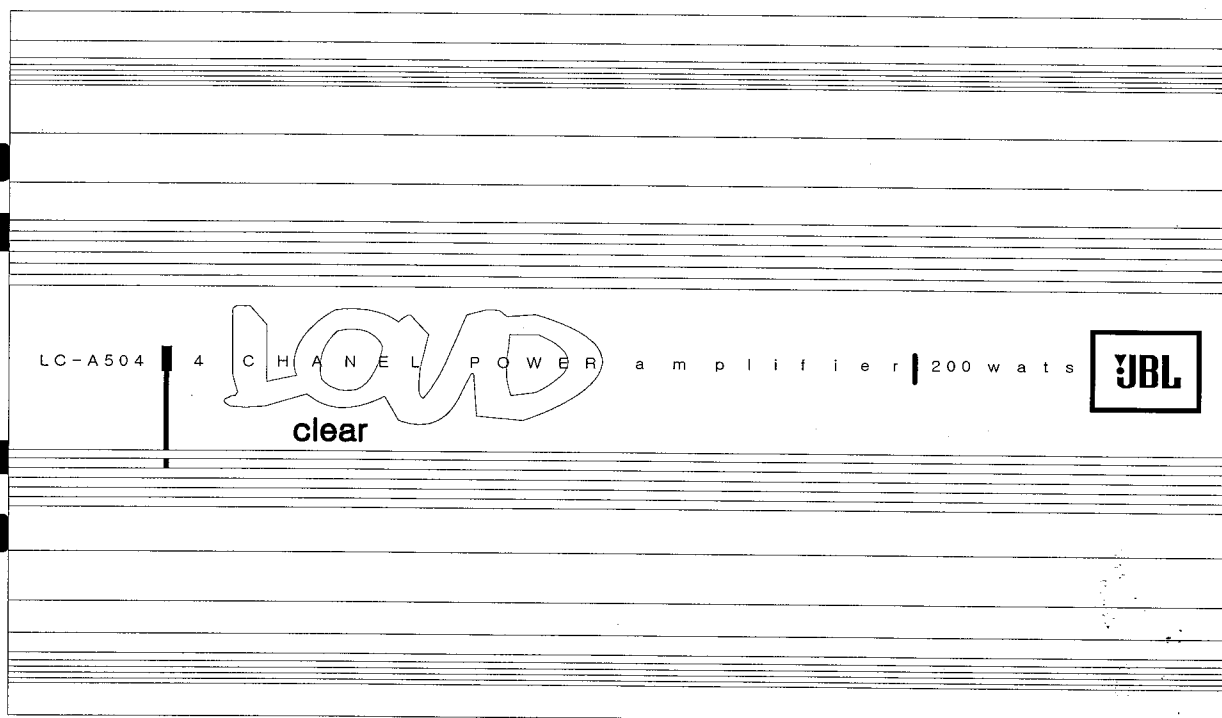


# LC-A504

The JBL logo, consisting of the letters "JBL" in a bold, sans-serif font, enclosed within a square border.

## 4 CHANNEL AUTOMOTIVE POWER AMPLIFIER

### TECHNICAL MANUAL



JBL CONSUMER PRODUCTS  
250 CROSSWAYS PARK DRIVE, WOODBURY, NY 11797  
8500 BALBOA BOULEVARD, NORTHRIDGE, VA91329  
WWW.JBL.COM

## Controls and Connections

Specifications .....	1	Parts Lists.....	6~8
Features .....	2	Block Diagrams.....	9
Test Conditions and Notes .....	2	Packaging Exploded View.....	10
Controls and Connections .....	3	Integrated Circuit Diagrams.....	11
Mounting the amplifier.....	3	Transistor Diagrams.....	12
Typical System Configuration (Wiring) .....	4	Schematic Diagrams.....	13~15
Printed Circuit Boards (Top View).....	5	Amplifier Exploded View.....	16

## SPECIFICATIONS

Number of Channels . . . . .	1, 2, 3, 4
4 Ohms Stereo . . . . .	50W x 4
2 Ohms Stereo . . . . .	62.5W x 4
4 Ohms Bridged . . . . .	125W x 2
T.H.D. @ 4 Ohms rated Power . . . . .	0.1%
Frequency Response . . . . .	20Hz ~ 40KHz (+1, -2dB)
Signal to noise Ratio . . . . .	> 90 dB
Slew Rate . . . . .	> 13 / us
Channel Separation . . . . .	> 60 dB
Damping Factor . . . . .	> 100
Crossover Slope . . . . .	12 dB / oct
Fuse Size . . . . .	20 AMP ATC Type ( 2Per Amplifier
Line Level Sensitivity . . . . .	250mV - 4V
DC Operating Range. . . . .	6V - 18V
Maximum Current Draw(4ohm BRG) . . . . .	47A
External Dimensions (Inches)	
Length . . . . .	2-5/16"
Width . . . . .	8-5/16"
Depth . . . . .	14-1/16"
External Dimensions (mms)	
Length . . . . .	58mm
Width . . . . .	217mm
Depth . . . . .	357mm

JBL continually strives to improve its products. New materials, production methods and design refinements are introduced into existing models without notice as a routine expression of our design philosophy. For this reason, Loud and Clear® Series Multichannel Automotive Amplifiers may differ in some respects from their published specifications and descriptions, but will always equal or exceed the original specifications unless otherwise stated.

## Features

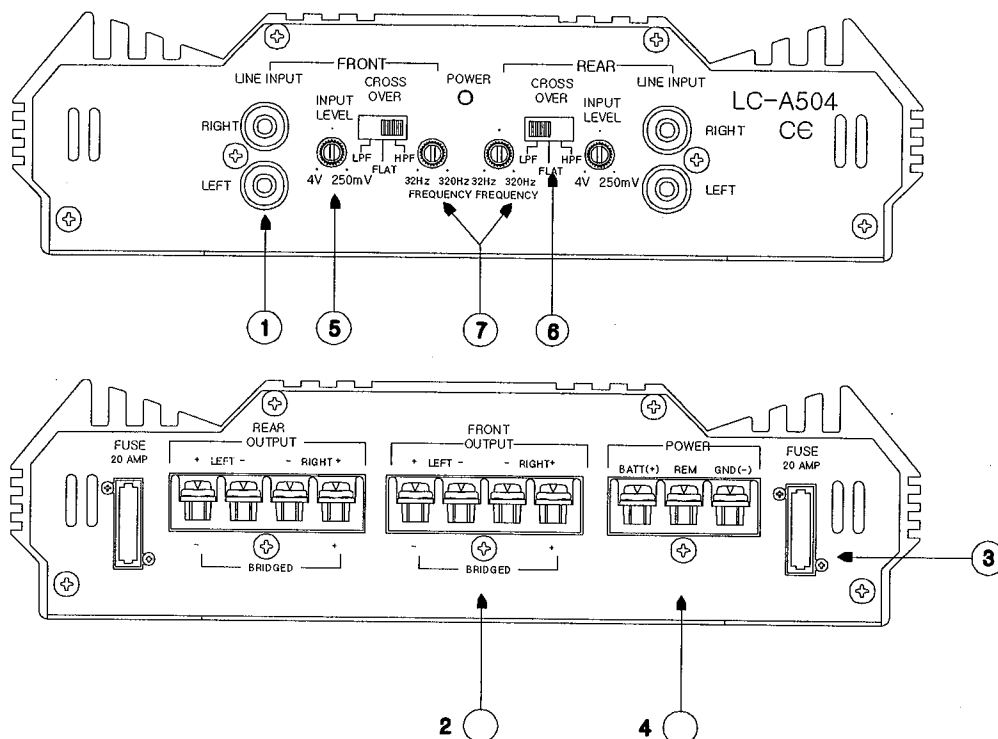
---

- 4-Channel Operation
- Built-in optional 12dB/oct Variable Crossover
- Advanced MOSFET Oversized Floating Rail Power Supply
- Floating Ground Factory – Head – Unit Speaker – Level input
- Variable Input Sensitivity (250mV – 4V)
- Fully Complementary Output Stage with Class-A Voltage Amplification
- Gold-plated Power, Input and Output Connectors
- 2-Ohm Stable (Stereo)

## Test Conditions and Notes

---

- All tests to be done, unless otherwise specified, from 20KHz to 40KHz at 14.4V DC into 4 ohm loads and adjust the units gain so that with a .775 volt input signal the unit is at its maximum rated output. All measurements will be done using an Audio precision system one and the supply voltage.
- An A+ line voltage of 14.4V DC shall be applied to the unit under test for all measurements unless otherwise specified. The voltage applied to the unit shall be measured at the power connection on the Amplifier.
- Signal Source  
Unless otherwise specified, all tests shall be conducted with the Audio Signal Generator output configured to be balanced, less than or equal to 50 ohm source impedance, and floating. The signal source "GND" shall be connected to the Amplifier PWR GND at the Amplifier.
- Output Load  
Unless otherwise specified, all tests shall be conducted with 4 ohm resistive loads having less than 10% reactive components at any frequency below 75KHz. Each resistor shall have a value that remains within 1% while dissipating the rated output of the unit under test.
- Power Indicator LED steadily illuminates for normal operation. LED blinks when protection circuitry is engaged, and during power up.



### Controls and Connections

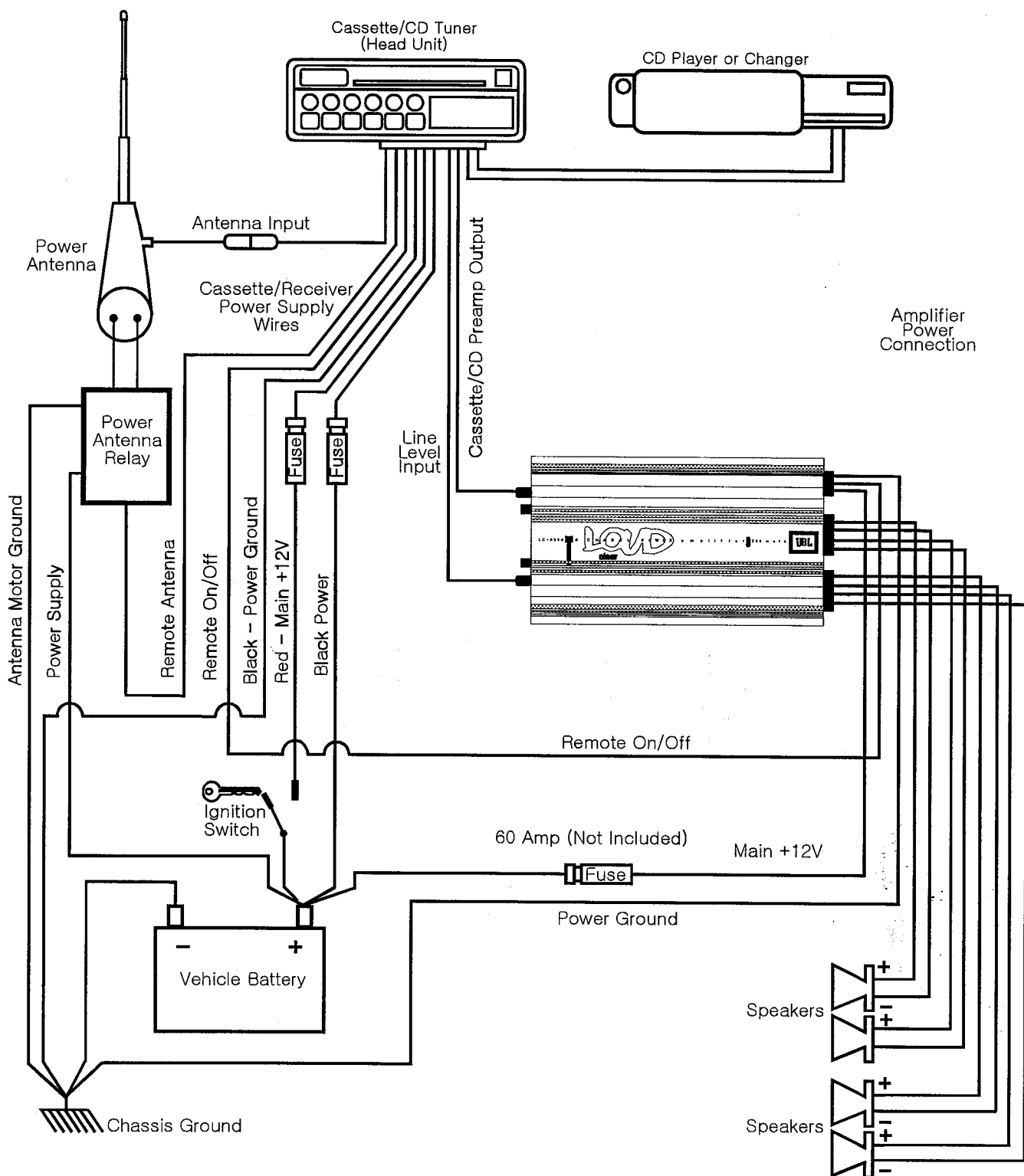
1. Preamp-Level Input Connector – Connects to line-level output from the source unit. If your radio has only speaker-level outputs, you must use a speaker-to-line-level adapter.
2. Speaker Output Connector – Connect speaker wiring to these connectors. See wiring instructions on page 4 for more information.
3. Fuse – Two 20 Amp ATC type Fuses.
4. Power Connection for 12V+, GND and REM connections for power wires. See wiring instructions on page 4 for more information.
5. Input-Level Control – Adjusts input sensitivity for pre-amp level and speaker level inputs.
6. Crossover Switch – When this switch is in the FLAT position the amplifier operates at full range frequencies; When in the LPF position, the amplifier operates in the Bass frequencies; when the switch is in the HPF position, the amplifier operates in the Upper frequencies.
7. Frequency adjustment – When the LPF/FLAT/HPF switch is either in the LPF or HPF position, this adjusts where the frequency response of the amplifier rolls off on the upper or lower end of the range, depending on switch position.

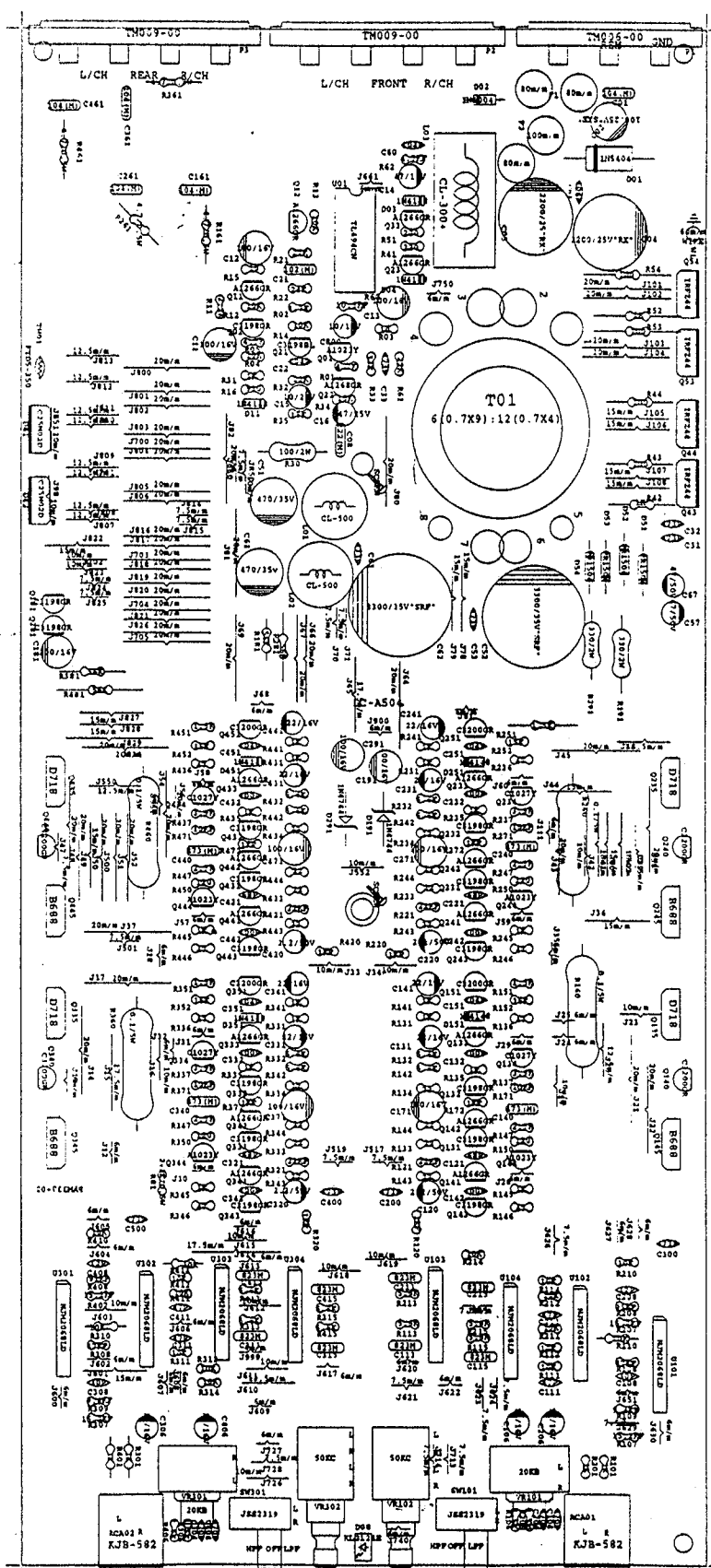
### Mounting the Amplifier

The JBL Loud + Clear Series amplifiers can be mounted in virtually any location inside the vehicle. However, make sure to keep the amplifier away from heater vents or ducts.

1. At the chosen site, use the amplifier as a mounting template and mark the locations of the four mounting holes.
2. Drill a small pilot hole at each marked location.
3. Mount the amplifier and securely tighten the mounting screws.

Typical System Configuration





## LC-A 504 Parts List

REF. NO	PART NO.	DESCRIPTION	Q'TY	REF. NO	PART NO.	DESCRIPTION	Q'TY
Main PCB, Preamp, Crossover, Power Supply and Power Amplifier				R03,15	RE202010002	CARBON FILM 1/5W 5% ( 10 OHM )	2
<b>F.E.T</b>				R11	RE20202202	CARBON FILM 1/5W 5% ( 2.2K OHM )	1
Q43,44,53 Q54	FE100440112	N-CH MOSFET ( IRFZ44 )	4	R4,12,13 R14,110,111 R112,114,210 R211,212,214 R310,311,312 R314,410,411 R412,414	RE202010302	CARBON FILM 1/5W 5% ( 10K OHM )	20
<b>TRANSISTORS</b>				R16	RE202910002	CARBON FILM 1/5W 5% ( 910 OHM )	1
Q01,144,244 Q344,444	TR010233100	SMALL SIGNAL PNP (A1023Y)	5	R21	RE202027302	CARBON FILM 1/5W 5% ( 27K OHM )	1
Q02,131,132 Q143,181,231 Q232,243,281 Q331,332,343 Q431,432,443	TR031981100	SMALL SIGNAL NPN (C3198GR)	15	R22	RE202024302	CARBON FILM 1/5W 5% ( 24K OHM )	1
Q11,12,23 Q33,133,141 Q142,233,241 Q242,333,341 Q342,433,441 Q442	TR012661200	SMALL SIGNAL PNP (A1266GR)	16	R30	RE306100000	METAL FILM 2W 5% ( 100 OHM )	1
Q21	TR031984100	SMALL SIGNAL NPN (C3198BL)	1	R31,42,52 R101,131,135 R141,145,201 R231,235,241 R245,301,331 R335,341,345 R401,431,435 R441,445	RE202001302	CARBON FILM 1/5W 5% ( 1K OHM )	23
Q22	TR012681200	SMALL SIGNAL PNP (A1268GR)	1	R32,61	RE202022302	CARBON FILM 1/5W 5% ( 22K OHM )	2
Q134,234,334 Q434	TR010273100	SMALL SIGNAL NPN (C1027Y)	4	R33	RE202033302	CARBON FILM 1/5W 5% ( 33K OHM )	1
Q135,235,335 Q435	TR107182114	AUDIO POWER NPN (D718)	4	R34,35,152 R252,352,452	RE202015302	CARBON FILM 1/5W 5% ( 15K OHM )	6
Q140,240,340 Q440	TR032001100	SMALL SIGNAL NPN (C3200GR)	4	R41,51	RE202220002	CARBON FILM 1/5W 5% ( 220 OHM )	2
Q145,245,345 Q445	TR106882214	AUDIO POWER NPN (B688)	4	R43,44,53 R54	RE202100002	CARBON FILM 1/5W 5% ( 100 OHM )	4
Q151,251,351 Q451	TR032001100	SMALL SIGNAL NPN (C3200GR)	4	R60	RE21205202	CARBON FILM 1/5W 1% ( 10.5K OHM )	1
<b>DIODES</b>				R62	RE212047202	CARBON FILM 1/5W 1% ( 4.7K OHM )	1
D01	DI054040011	RECTIFIER (1N5404)	1	R81	RE204022202	CARBON FILM 0.5W 5% ( 2.2K OHM )	1
D02	DI040040010	RECTIFIER ( 1N4004 )	1	R106,151,206 R251,306,351 R406,451	RE202015202	CARBON FILM 1/5W 5% ( 1.5K OHM )	8
D03,04,11 D151,251,351 D451	DI041480000	SWITCHING SIGNAL (1N4148)	7	R107,207,307 R407	RE212152202	CARBON FILM 1/5W 1% ( 15.2K OHM )	4
D08	DI000124471	GREEN (KLG124E)	1	R108,308	RE212047302	CARBON FILM 1/5W 1% ( 47K OHM )	2
D41,42	DI002502031	FAST RECOVERY (ESC25M02D)	2	R109,309	RE212094202	CARBON FILM 1/5W 1% ( 9.4K OHM )	2
D51,52,53 D54	DI001504111	FAST RECOVERY (PR1504)	4	R113,115,132 R142,213,215 R232,242,313 R315,332,342 R413,415,432 R442	RE202056202	CARBON FILM 1/5W 5% ( 5.6K OHM )	16
D191,291	DI047440040	ZENER DIODE 1W (1N4744)	2	R120,172,220 R272,320,372 R420,472	RE212001302	CARBON FILM 1/5W 1% ( 1K OHM )	8
<b>I.C</b>				R121,221,321 R421	RE212022302	CARBON FILM 1/5W 1% ( 22K OHM )	4
U01	IC017049400	P.W.M (TL494CN)	1	R133,134,143 R144,233,234 R243,244,333 R334,343,344 R433,434,443 R444	RE202022002	CARBON FILM 1/5W 5% ( 22 OHM )	16
U101,102,103 U104,301,302 U303,304	IC007206802	DUAL OP AMP (NJM2068LD)	8				
<b>RESISTORS</b>							
R01,02,05	RE202047202	CARBON FILM 1/5W 5% ( 4.7K OHM )	3				

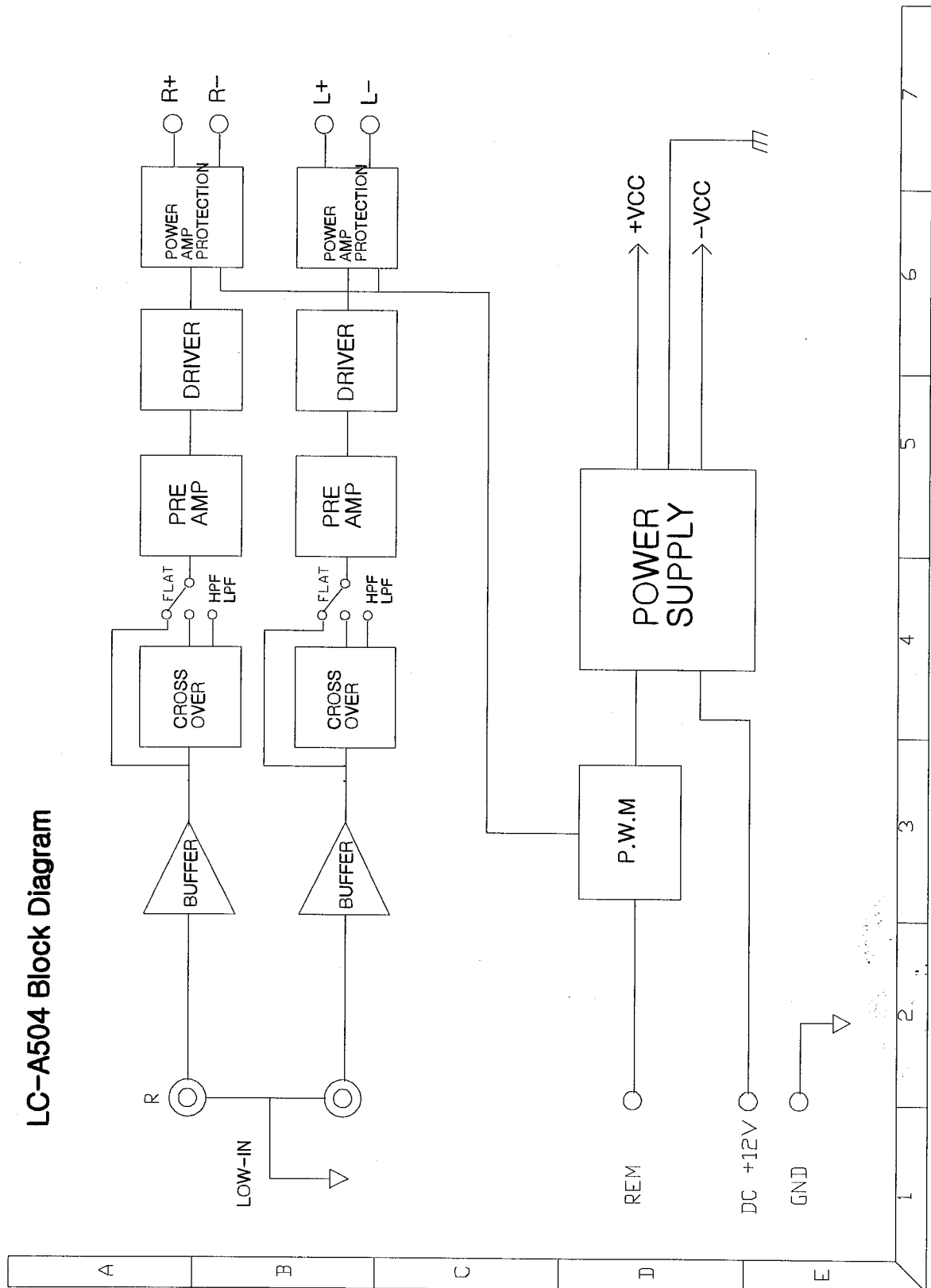
REF. NO	PART NO.	DESCRIPTION	Q'TY	REF. NO	PART NO.	DESCRIPTION	Q'TY
R136,146,236 R246,336,346 R436,446	RE202047002	CARBON FILM 1/5W 5% ( 47 OHM )	8	C108,308	CC011300100	CERAMIC DISK 50V "NPO" ( 30pF 0	2
R137,237,337 R437	RE202039202	CARBON FILM 1/5W 5% ( 3.9K OHM )	4	C111,211,311 C411	CC011470100	CERAMIC DISK 50V "NPO" ( 47pF )	4
R147,247,347 R447	RE202027202	CARBON FILM 1/5W 5% ( 2.7K OHM )	4	C121,221,321 C421	CC011680100	CERAMIC DISK 50V "NPO" ( 68pF )	4
R150,250,350 R450	RE202120002	CARBON FILM 1/5W 5% ( 120 OHM )	4	C132,142,232 C242,332,342 C432,,442	CC011101100	CERAMIC DISK 50V "NPO" ( 12pF )	2
R160,260,360 R460	RE507001801	WIRE WOUND 5W 5% ( 0.1 OHM )	4	C208,408	CC011120100	CERAMIC DISK 50V "NPO" ( 100pF )	8
R161,261,361 R461	RE204047802	CARBON FILM 0.5W 5% ( 4.7 OHM )	4	<b>MISCELLANEOUS</b>			
R171,271,371 R471	RE212010302	CARBON FILM 1/5W 1% ( 10K OHM )	4	TH01	TH100500010	NTC RESISTOR (FTD5-350)	1
R181,281,381 R481	RE202056302	CARBON FILM 1/5W 5% ( 56K OHM )	4	T01	TF137061201	TROIDAL CORE	1
R191,291	RE306033000	METAL FILM 2W 5% ( 330 OHM )	2	L01,02	AR312152750	DC CHOKE DRUM COIL ( CL-500 )	2
R208,408	RE212091302	CARBON FILM 1/5W 1% ( 91K OHM )	2	L03	AR201250130	DC CHOKE BAR COIL ( CL-300+ )	1
<b>CAPACITORS</b>				VR101,301	VO112203612	POTENTIOMETER (20K DUAL GANG)	2
C02	EC050171010	ELECTROLYTIC "SXE" ( 100uF/25V )	1	VR102,302	VO114503003	POTENTIOMETER (50K DUAL GANG)	2
C04,05	EC050131221	ELECTROLYTIC "RX" ( 2200uF/25V )	2	SW101,301	SW023223190	SLIDE SWITCH (JSS-2319)	2
C11,12,13 C171,181,191 C271,291,371 C471	EC040111010	ELECTROLYTIC "SMS" ( 100uF/16V )	10	RCA01,02	JA020582001	RCA JACK(KJB-582)	2
C14	EC040114700	ELECTROLYTIC "SMS" ( 47uF/16V )	1	P01	TE000060000	POWER TERMINAL (TM 006-00)	1
C15	EC050111000	ELECTROLYTIC "SMS" ( 10uF/25V )	1	P02,03	TE000090000	SPEAKER TERMINAL (TM 009-00)	2
C16	EC050114700	ELECTROLYTIC "SMS" ( 47uF/25V )	1	FH1	FH015543000	FUSE HOLDER (155430U)	2
C51,61	EC060114710	ELECTROLYTIC "SMS" ( 470uF/35V )	2	W01	WI022000600	GND WIRE AWG#22 BK 60m/m	1
C52,62	EC060053321	ELECTROLYTIC "SRF" ( 3300uF/35V )	2		WI014020800	GND WIRE AWG#22 RED 100m/m	2
C57,67	EC070114700	ELECTROLYTIC "SMS" ( 47uF/50V )	2		WI014021500	GND WIRE AWG#14 RED 150m/m	2
C106,206,306 C406,800	EC040111000	ELECTROLYTIC "SMS" ( 10uF/16V )	5	LED	TB000600100	TEFLON TUBE 0.7 PHI (6m/m)	4
C120,220,320 C420	EC070112260	ELECTROLYTIC "SMS" ( 2.2uF/50V )	4	TR	TB001000100	TEFLON TUBE 0.7 PHI (10m/m)	4
C131,141,231 C241,331,341 C431,441	EC040112200	ELECTROLYTIC "SMS" ( 22uF/16V )	8	TH	TB001200100	TEFLON TUBE 0.7 PHI (12m/m)	2
				FET,DIODE	mP010008000	PAPER SPACER (10x8x0.5t)	6
				POWER TR	mP015006000	PAPER SPACER (15x7x0.5t)	8
				2EA ACC'Y	FU030120301	FUSE 20A	4
C01,161,261 C361,461	MC001110400	MYLAR ±5% 50V (.1μf)	5				
C08	MC001122200	MYLAR ±5% 50V (.0022μf)	1				
C21	MC001110200	MYLAR ±5% 50V (.001μf)	1				
C113,115,213 C215,313,315 C413,415	MC001182310	MYLAR ±5% 50V (.082μf)	8				
C140,240,340 C440	MC001147300	MYLAR ±5% 50V (.047μf)	4				



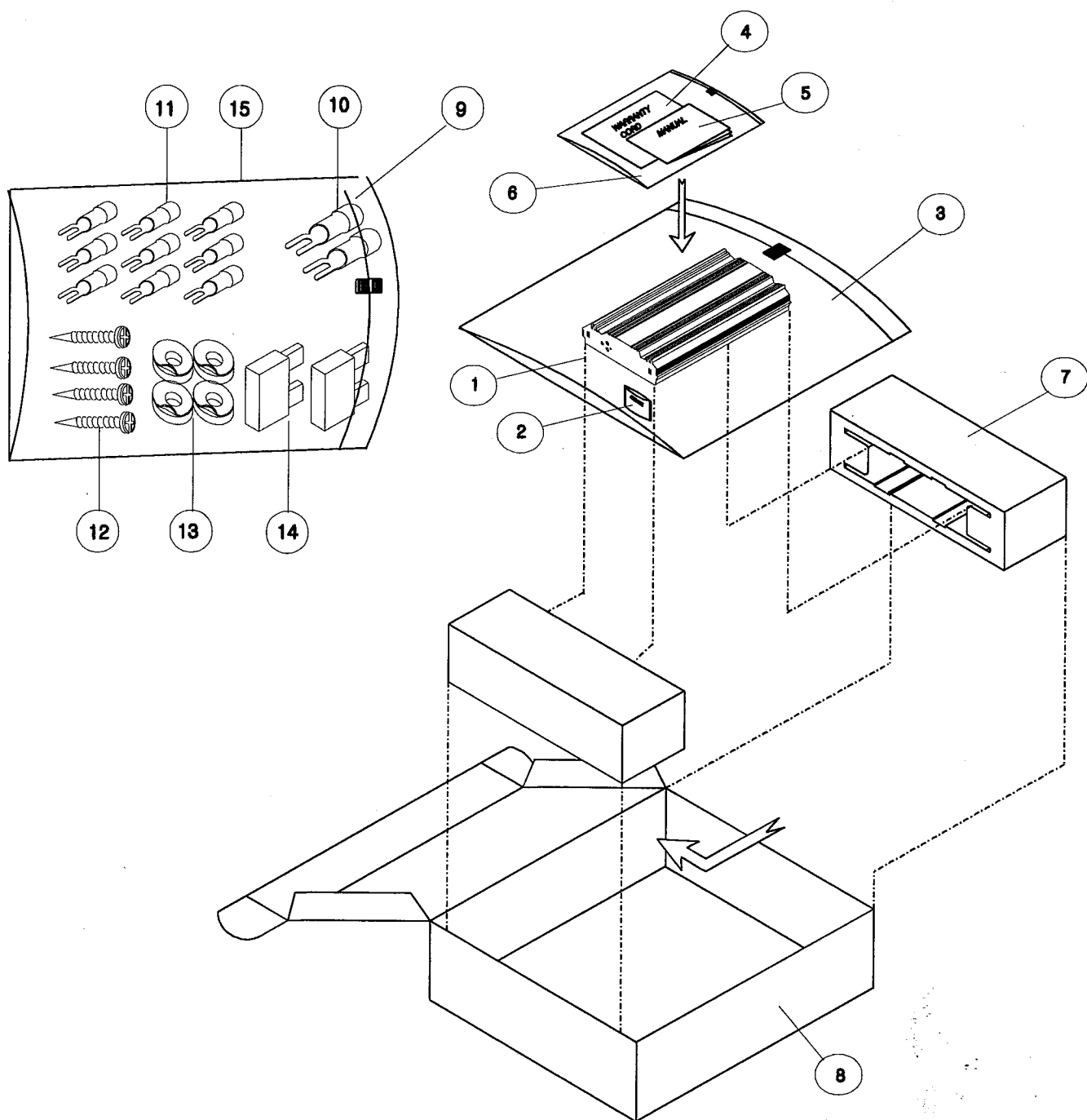
## LC-A 504 Parts List

REF. NO	PART NO.	DESCRIPTION	Q'TY
<b>MECHANICAL</b>			
MAIN HEAT SINK	MAHS6527920	AL BAR 330.0m/m	1
FRONT PANEL	MAFP6537731	EGI 1.0t	1
REAR PANEL	MARP6537741	EGI 1.0t	1
BOTTOM COVER	MABC6527890	EGI 1.0t L=329.5m/m	1
TR BRACKET (A)	MABR0341240	SBHG 200.0x22.5x2.0t	2
TR BRACKET (B)	MABR0341250	SBHG 200.0x25.5x2.0t	2
TR-BKT/ CUSHION	MOCU0241270	FIBER 200.0x20.0x1.5t	2
PAPER SPACER	MOCU0441491	PAPER 6.0x320.0x0.3t	2
SILICON PAD	MASP0141260	SP1000 200.0x22.0x0.3t	2
RUBBER CUSHION(A)	MOCU0141670	RUBBER PHI12.0xPHI5.0x2.0t	4
RUBBER CUSHION(B)	MOCU0141330	RUBBER 10.0x20.0x1.6t	5
RUBBER CUSHION(C)	MOCU0111140	RUBBER PHI 18.0x10.0t	1
SWITCH DECAL	MOSD0340230	FELT 15.0x7.0x0.3t	2
OPEN LUG (A)	MAOL0100010	DPF2-4 (2.5SQ)	9
OPEN LUG (B)	MAOL0100020	DPF5.5-4 (5.5SQ)	2
PCB SUPPORT	MASU0611040	NYLON (NATURAL)	2
SCREW	MNSC0423005	STT2 BH 3x5 NI	1
SCREW	MBSC0423006	STT2 BH 3x6 BK	8
SCREW	MBSC0423008	STT2 BH 3x8 BK	5
SCREW	MNSC0423016	STT2 BH 3x16 NI	1
SCREW	MBSC0433006	STT2 PH 3x6 BK	6
SCREW	MNSC0034016	SMP 4x16 NI	8
SCREW	MBSC0524020	STT1 BH 4x20 BK	4
POLY BAG (A)	MAPB0128001	VIINYL 310.0x500.0x0.1t	1
POLY BAG (B)	MAPB0128200	VINYL 225.0x320.0x0.07t	1
POLY BAG (C)	MAPB0141010	VINYL 80.0x100.0x0.03t	1
SNOW BOX "L,R"	MASN0227951	PS(40) NO:008	2
GIFT BOX	MAGB0510741	SW#1 418.0x268.0x104.0	1
CARTON BOX	MACB0210781	DW#2 446.0x433.0x288.0	1/4
MANUAL	LC-AMPOM		1

LC-A504 Block Diagram



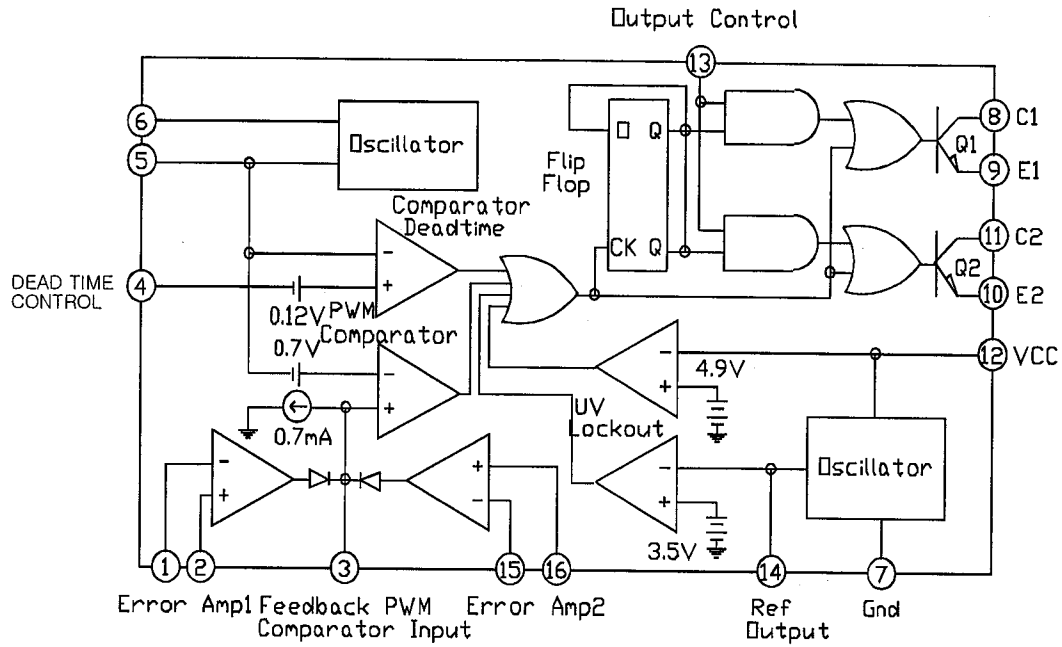
Packaging Exploded View



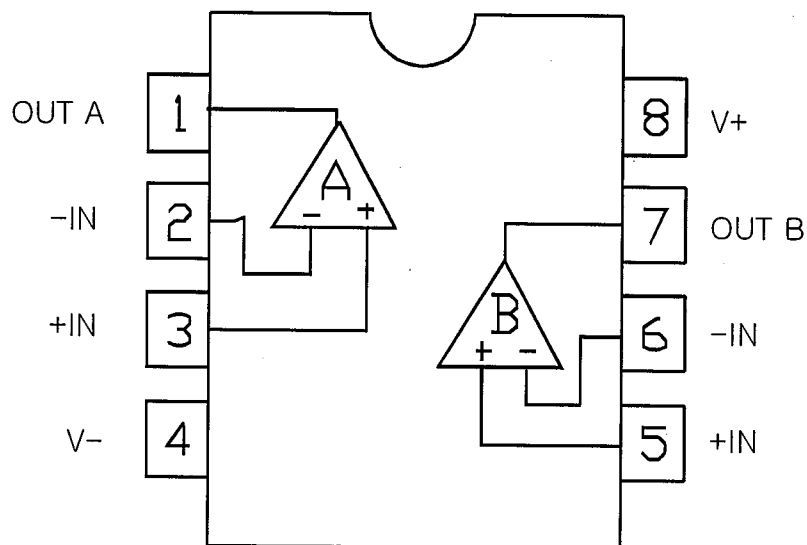
\* PACKAGE \*

①	LC-A504	SET	1	⑨	MABP0141010	POLY BAG	1
②	MOSG0147100	SILICAGEL	1	⑩	MAOL0100020	OPEN LUG	2
③	MAPB0128001	POLY BAG	1	⑪	MAOL0100010	OPEN LUG	9
④	MOMT0147110	WARRANTY CARD	1	⑫	MBSC0524020	SCREW	4
⑤	LC-AMPOM	MANUAL	1	⑬	MOCU0141670	RUBBER CUSHION	4
⑥	MAPB0128200	POLY BAG	2	⑭	FU030120301	FUSE	2
⑦	MASN0227951	SNOW BOX "L,R"	1	⑮	ACCKTILCA504	ACCESSORY KIT	1
⑧	MAGB0510741	GIFT BOX	1				

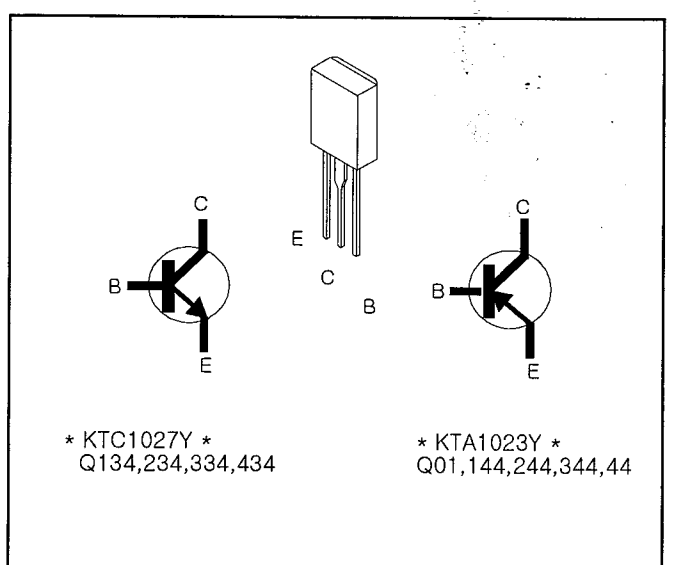
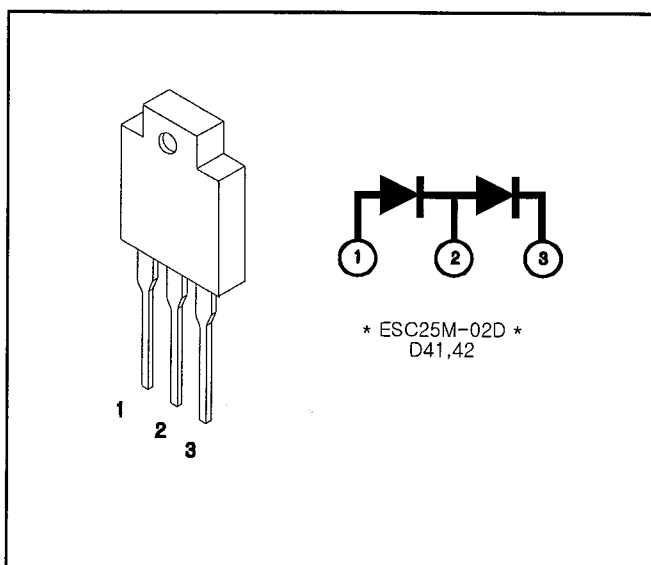
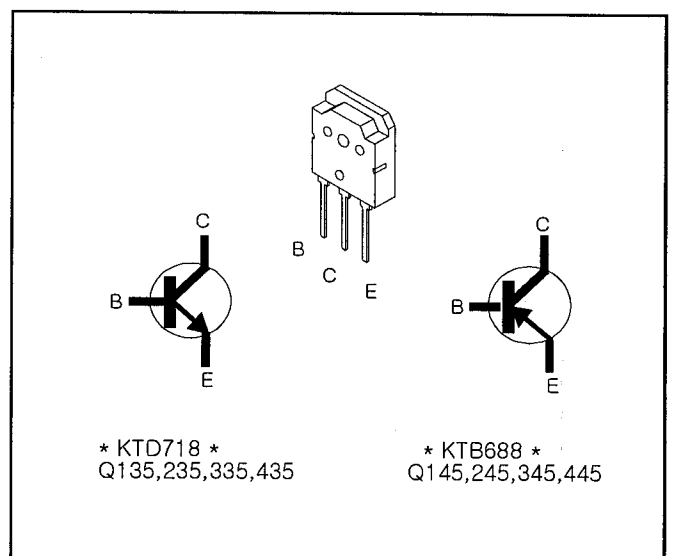
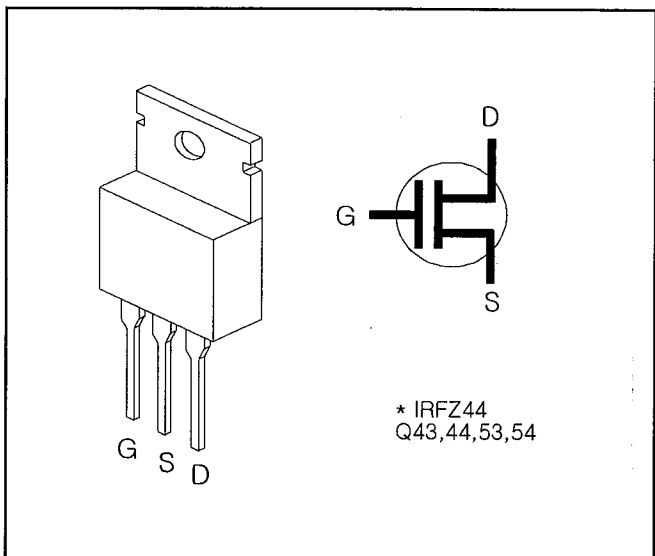
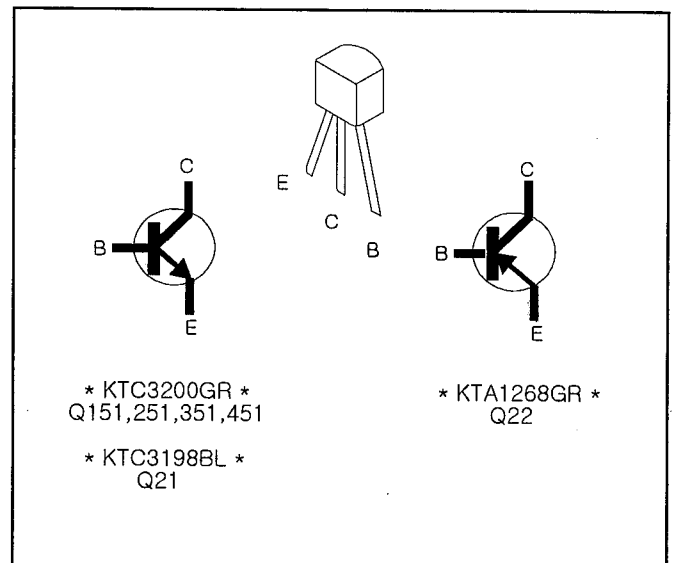
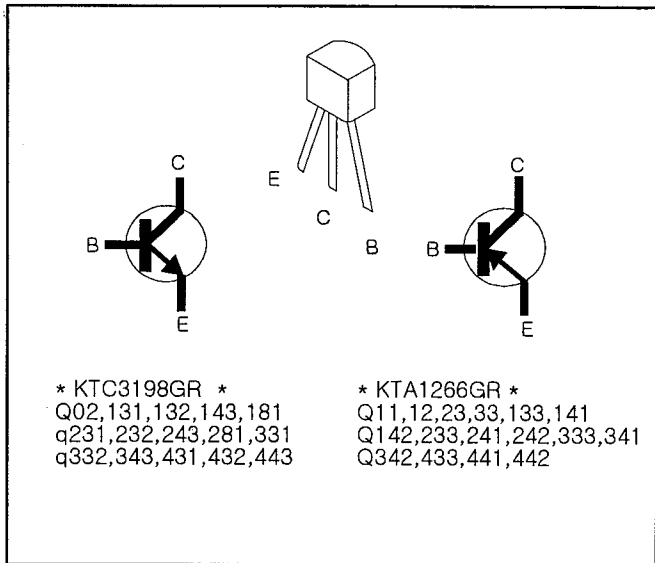
U01 (TL494CN) P.W.M IC

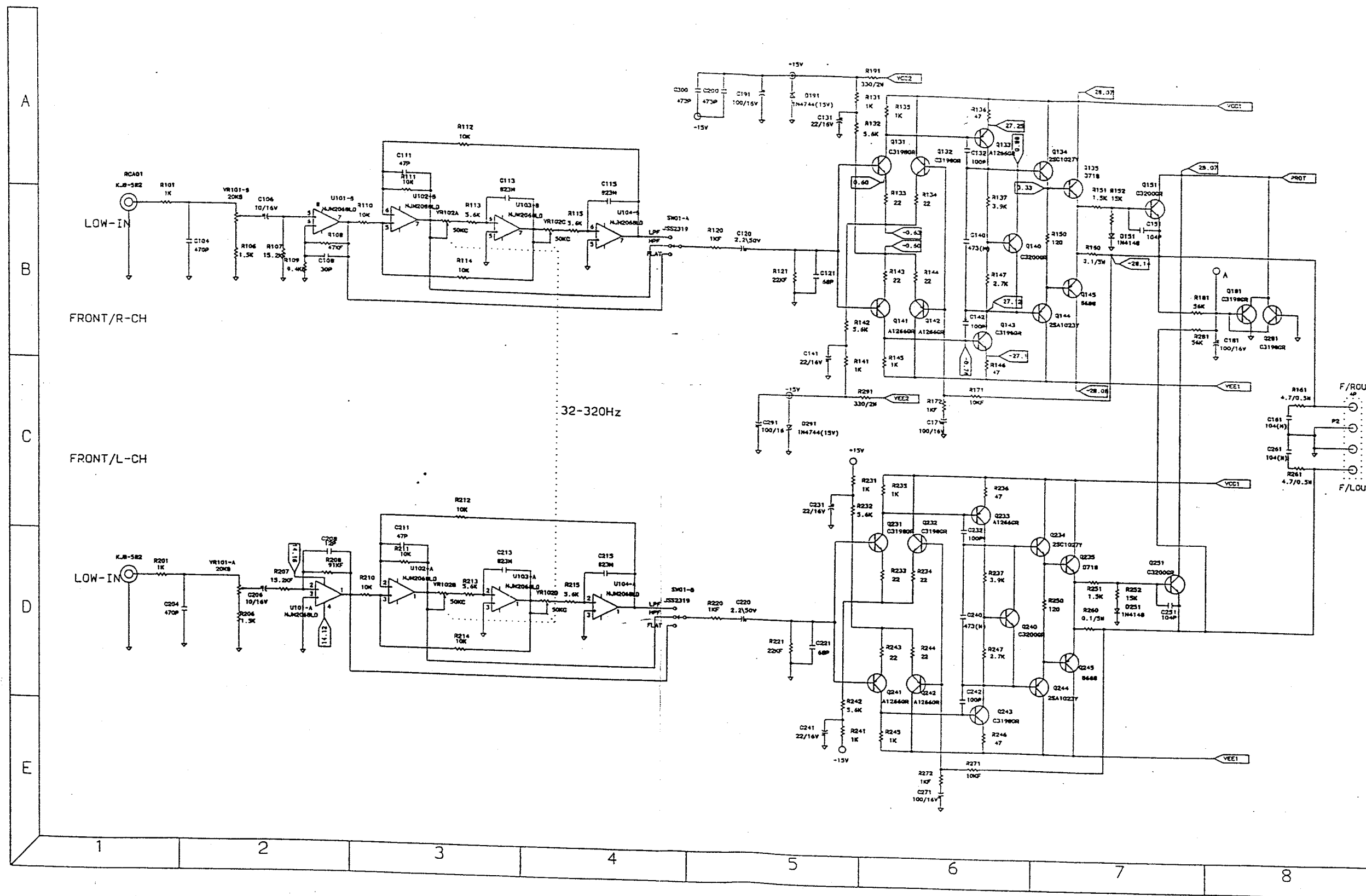


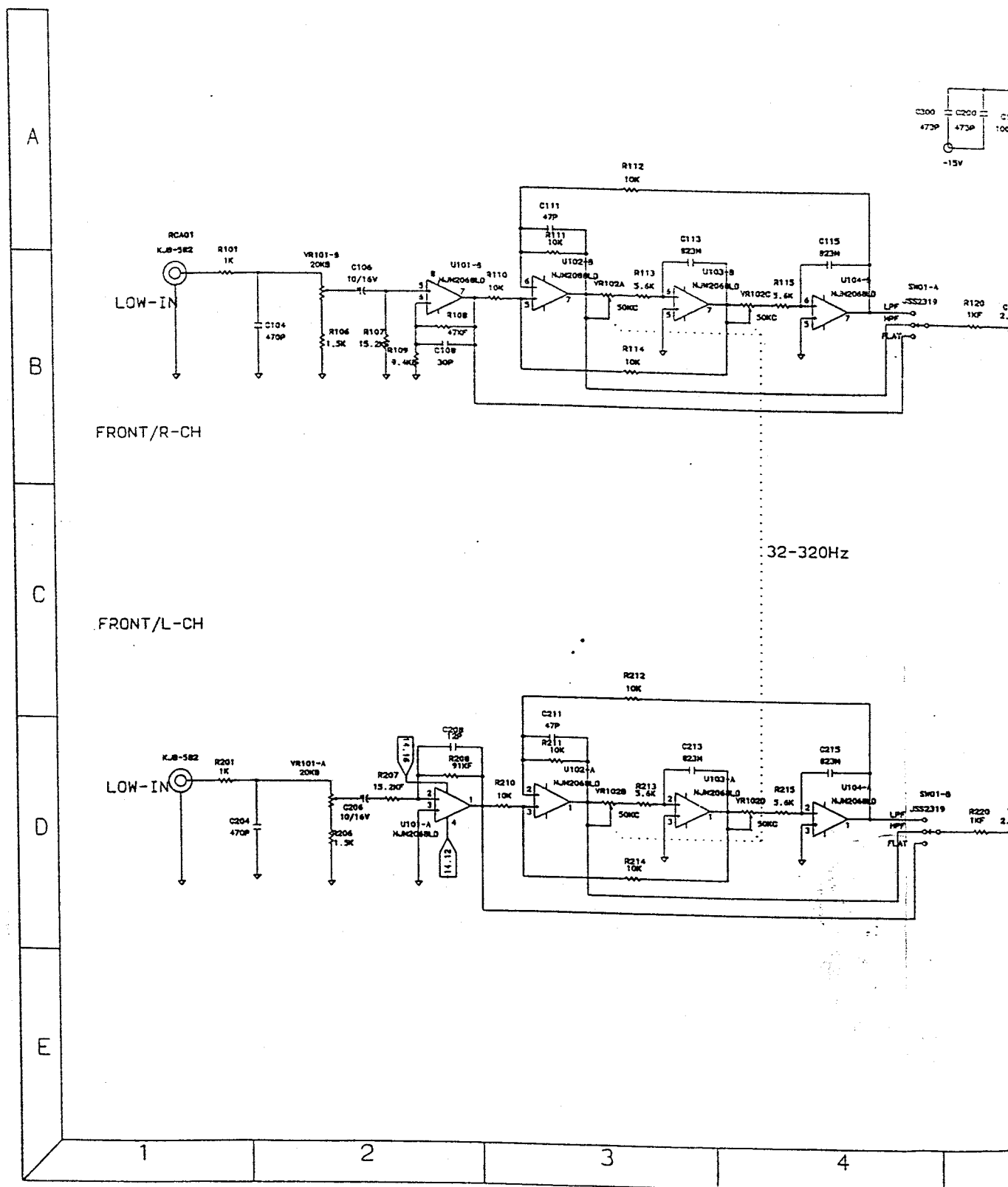
U101,102,103,104,301,302,303,304 (NJM-2068L) - DUAL OP AMP

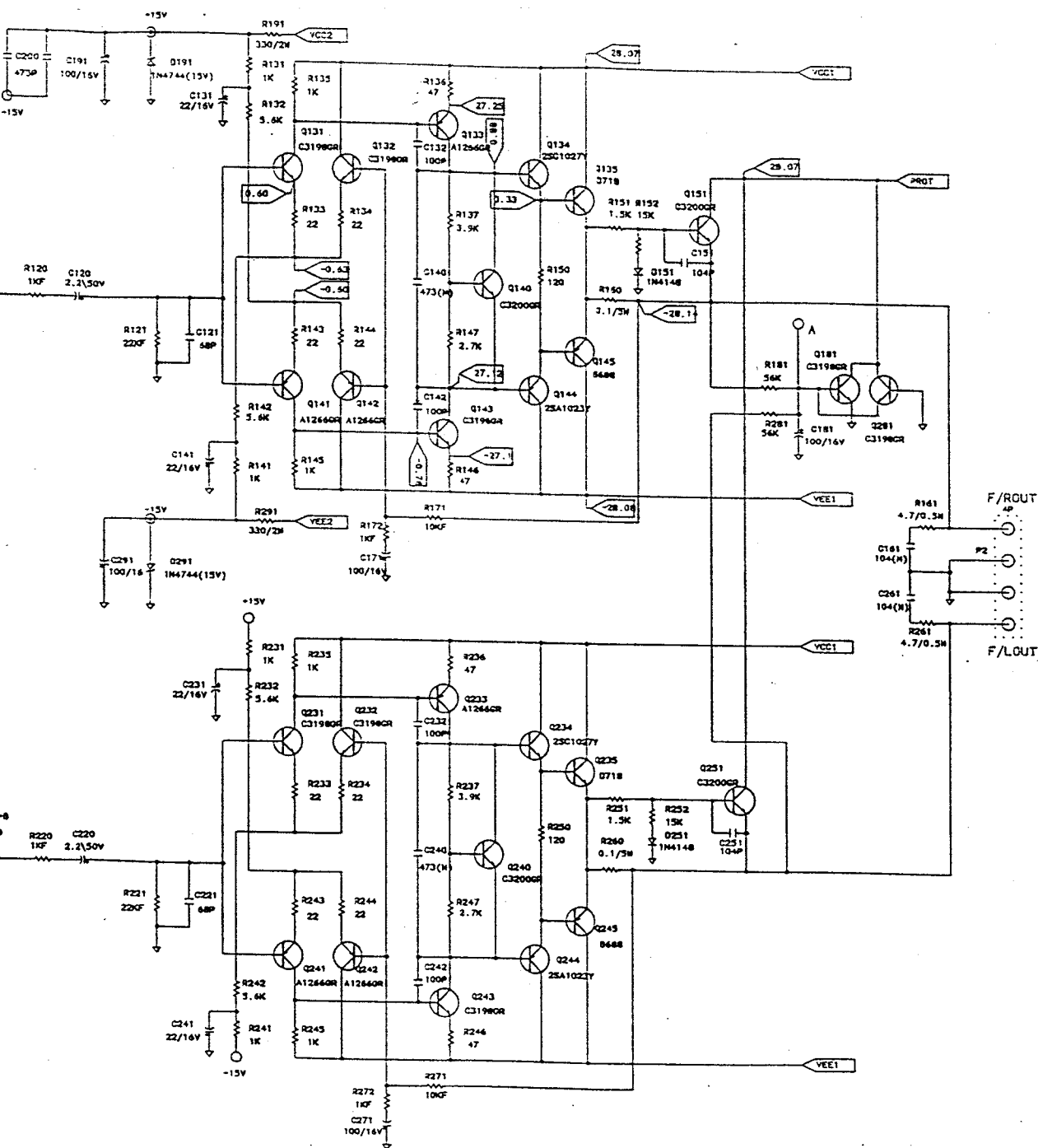


Transistor Diagrams



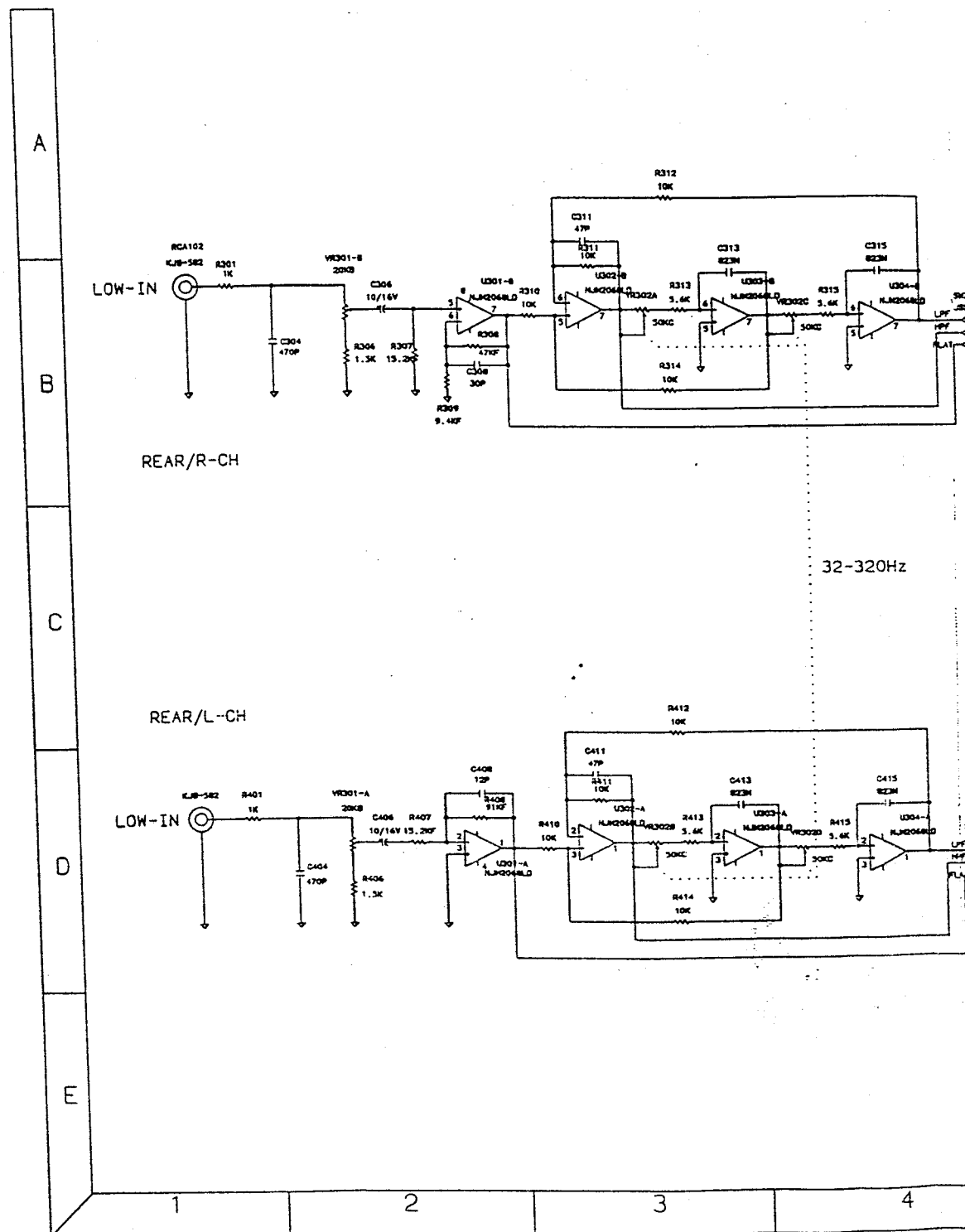


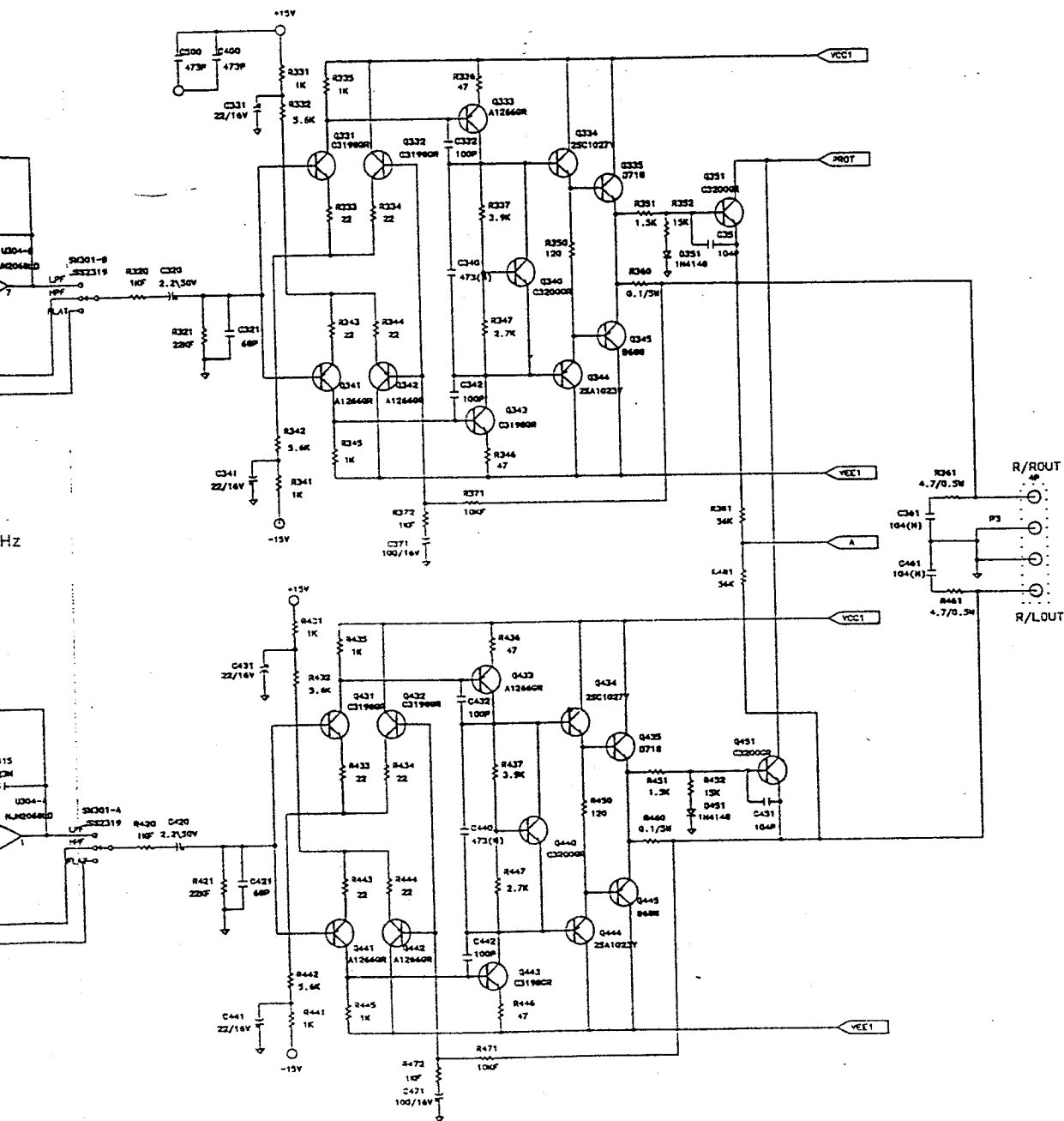


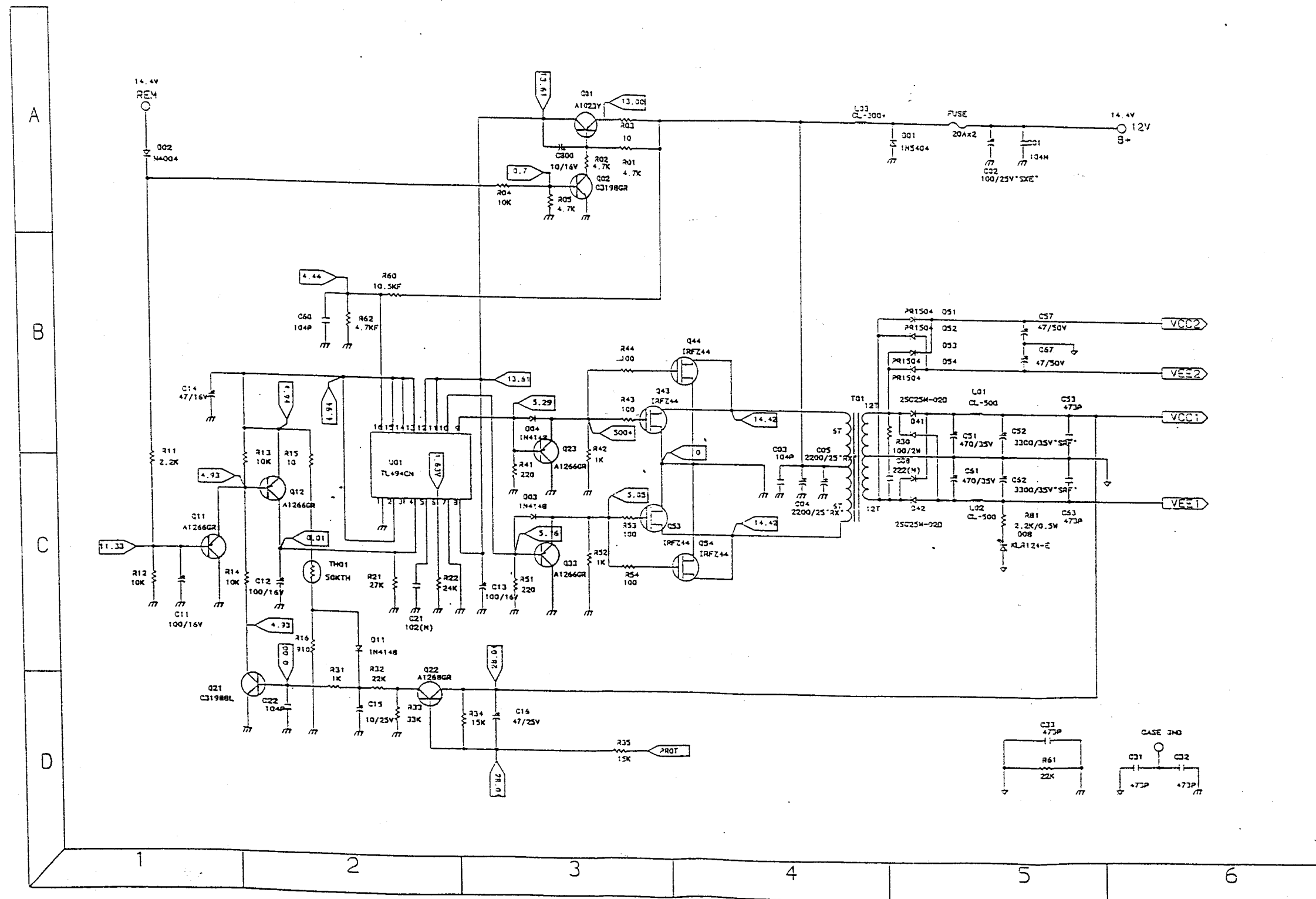


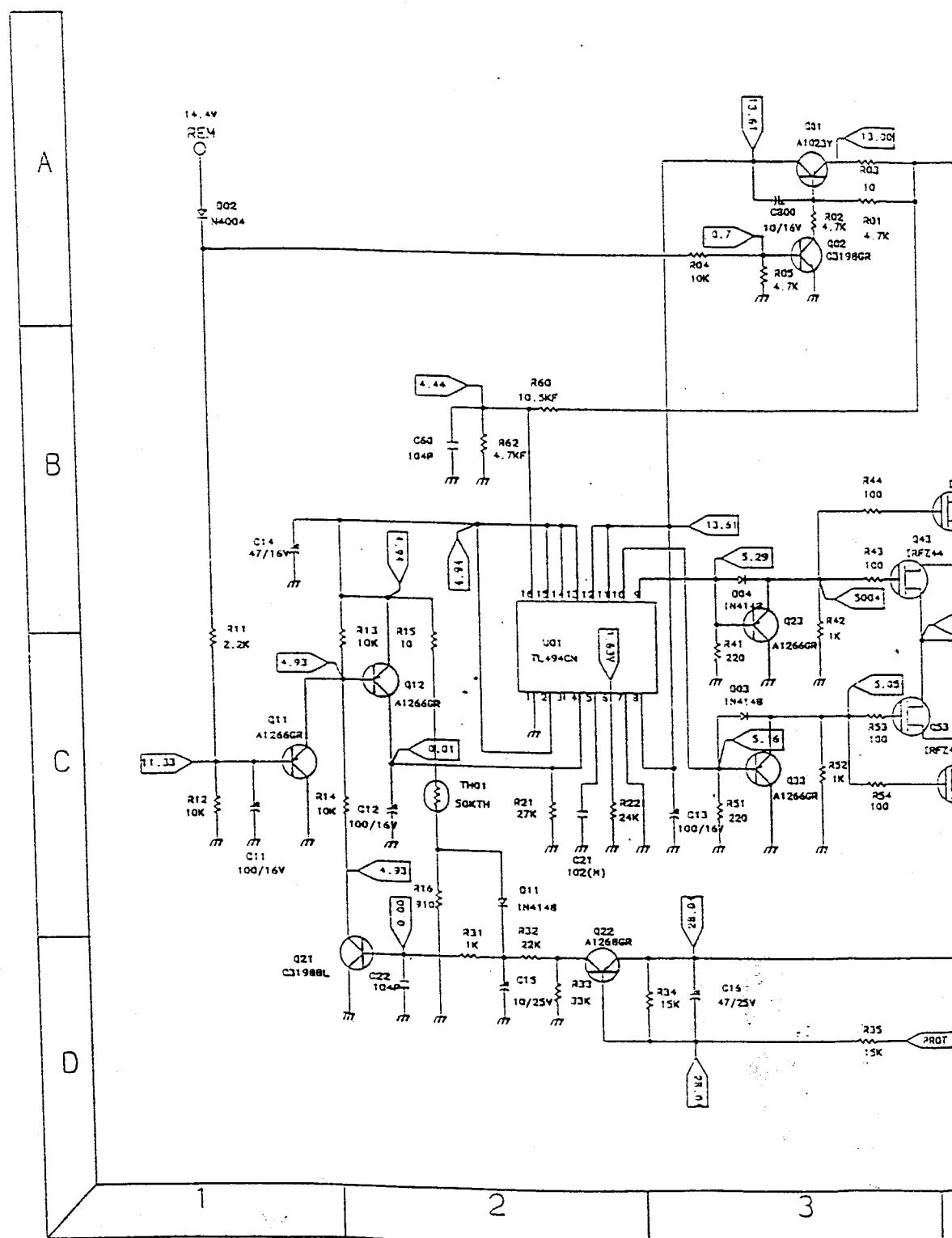


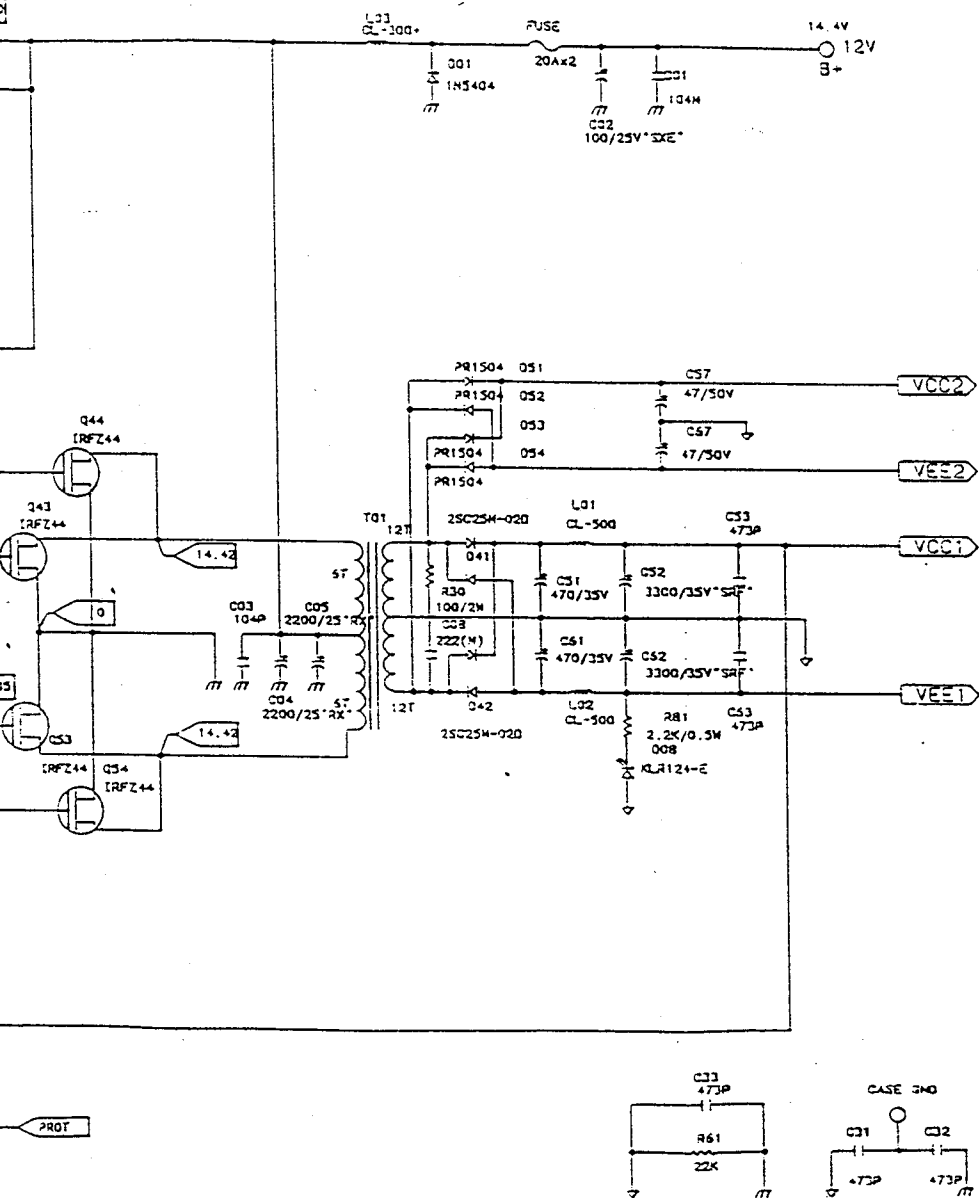








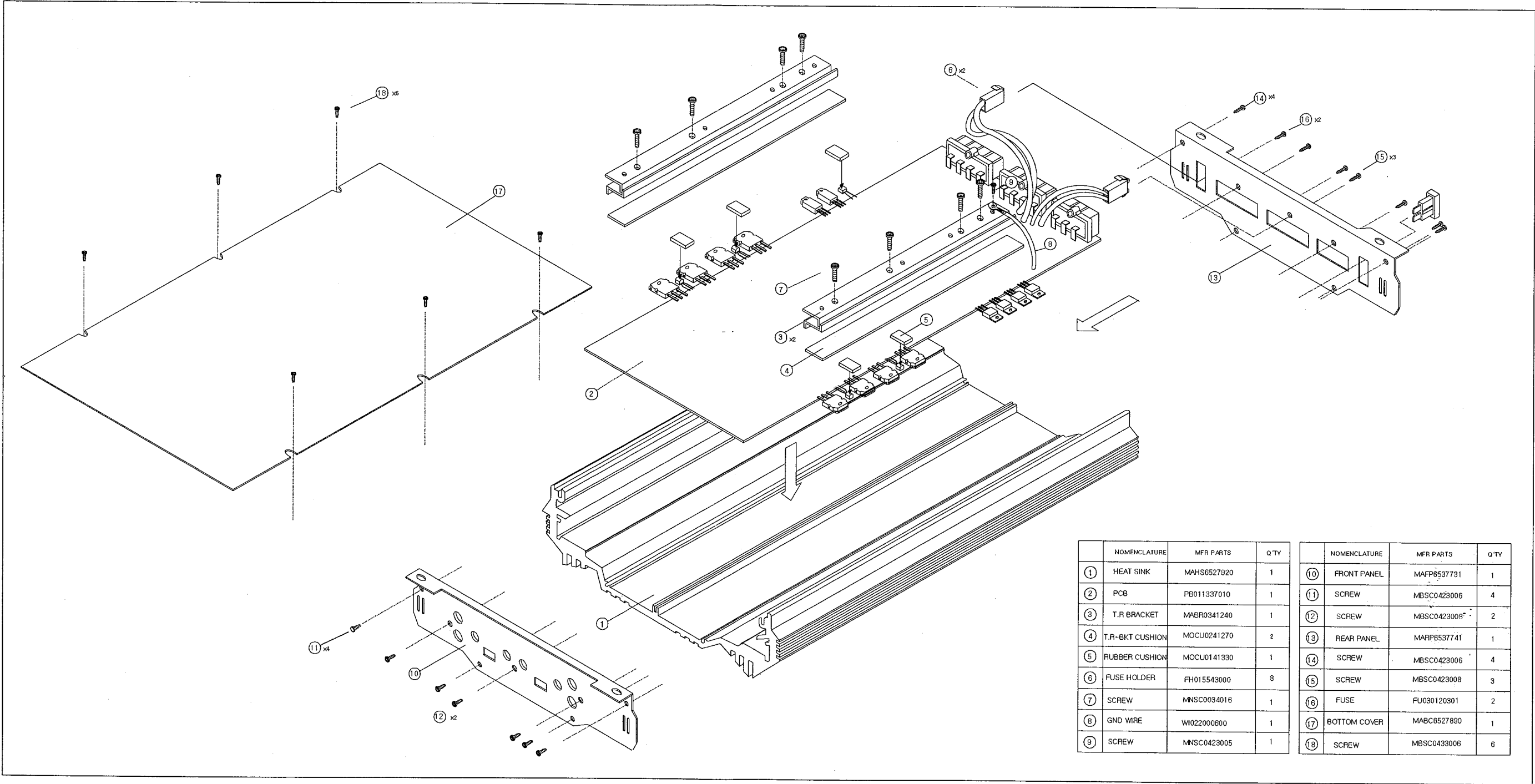


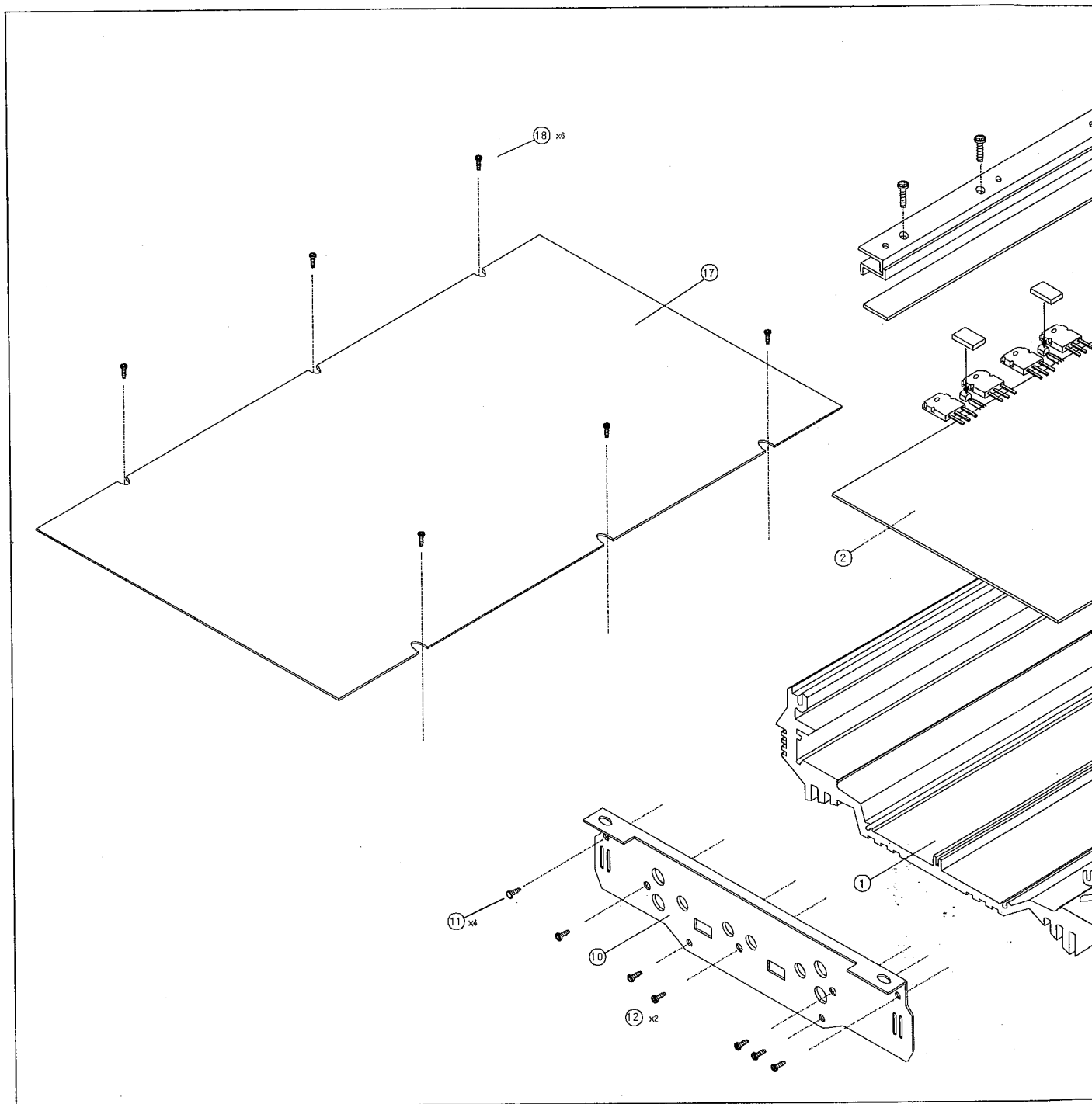


4

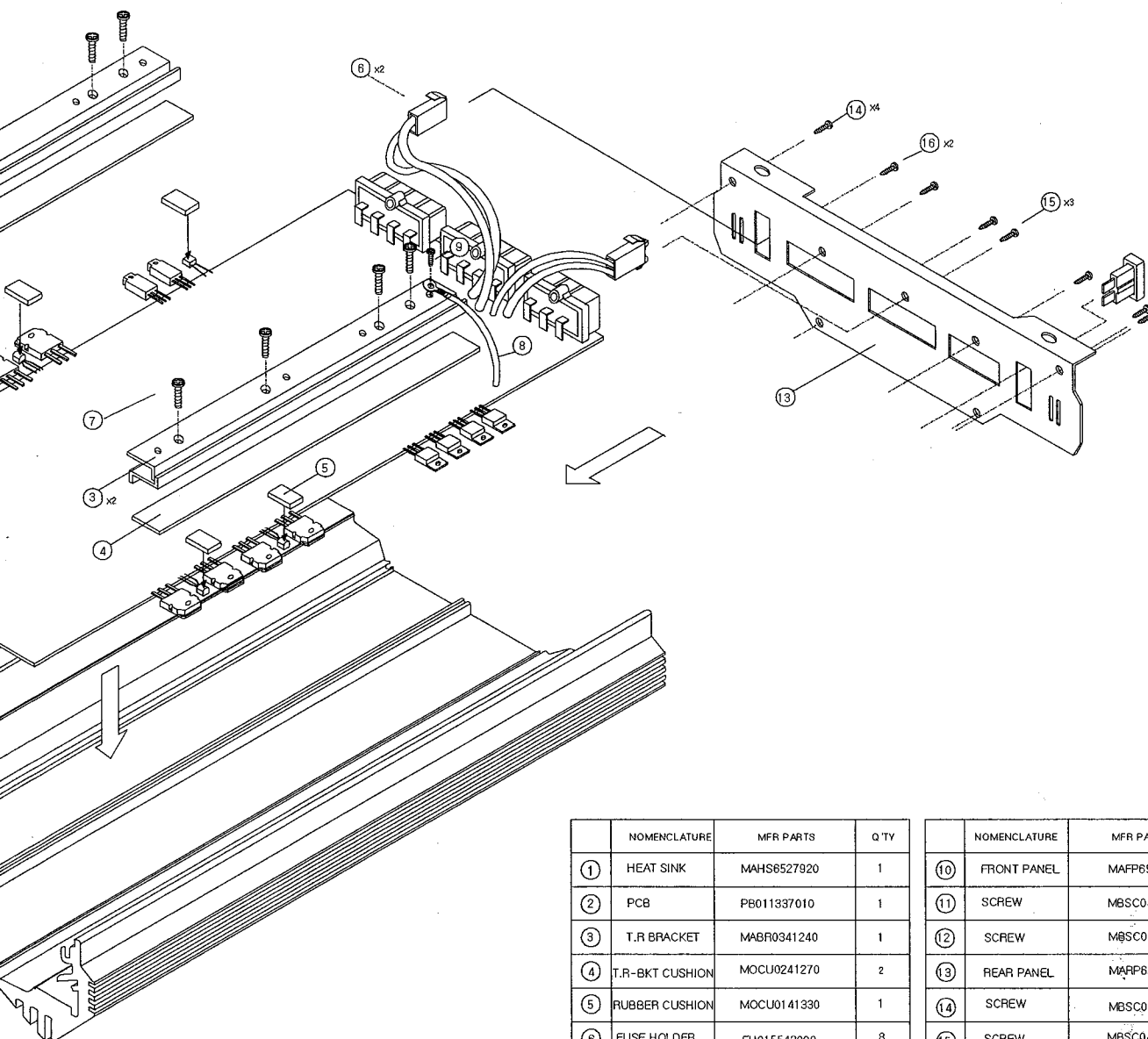
5

6



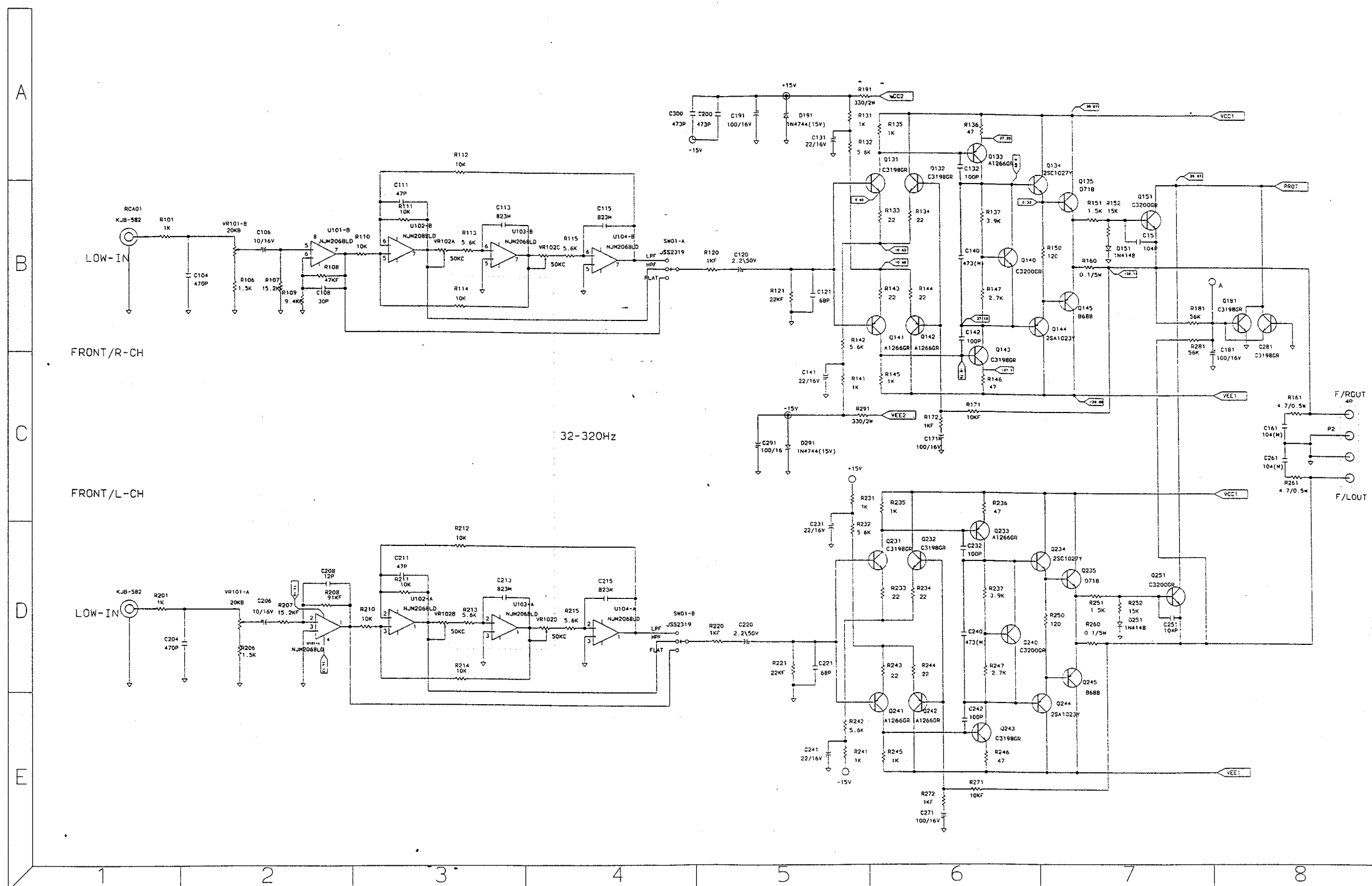


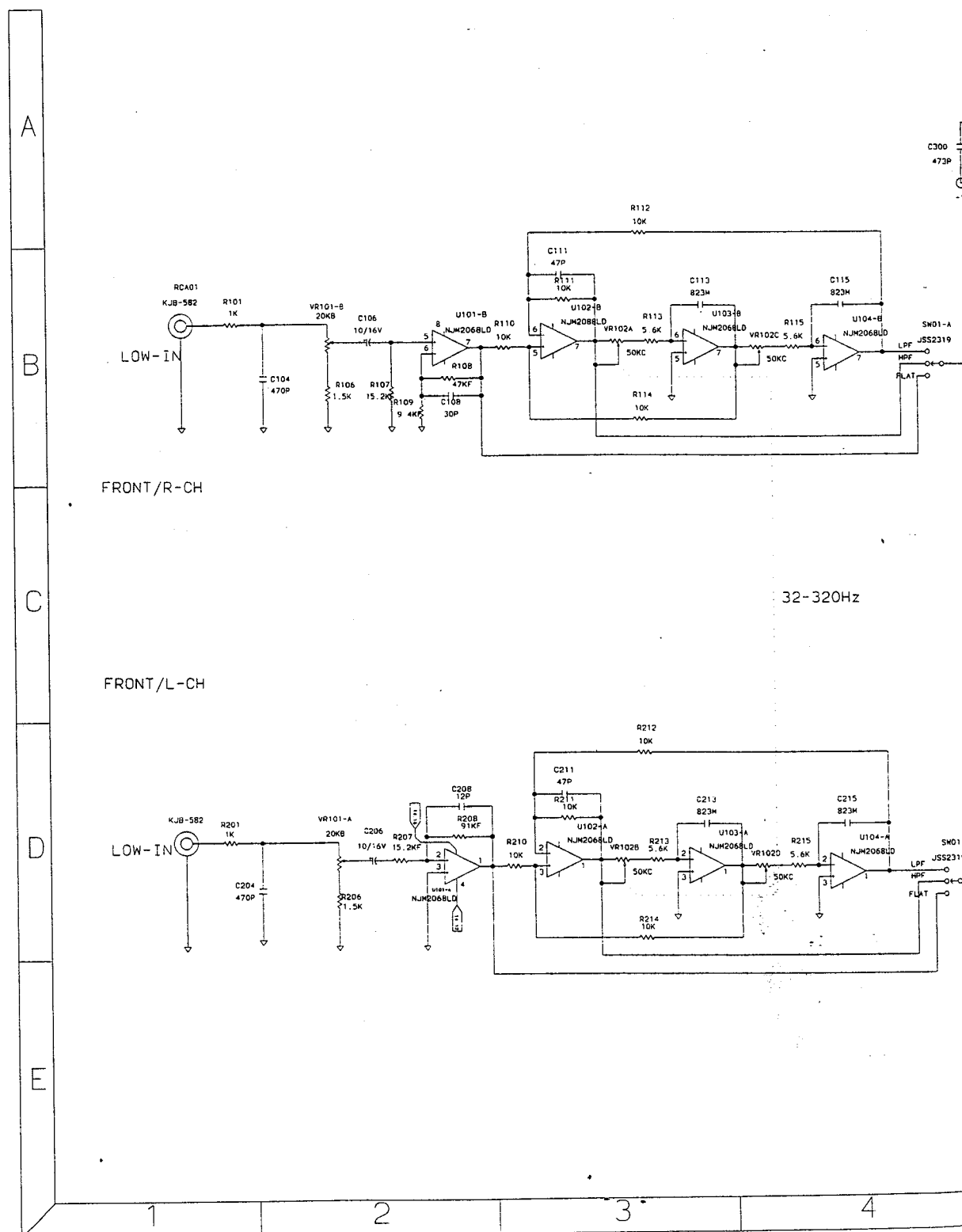


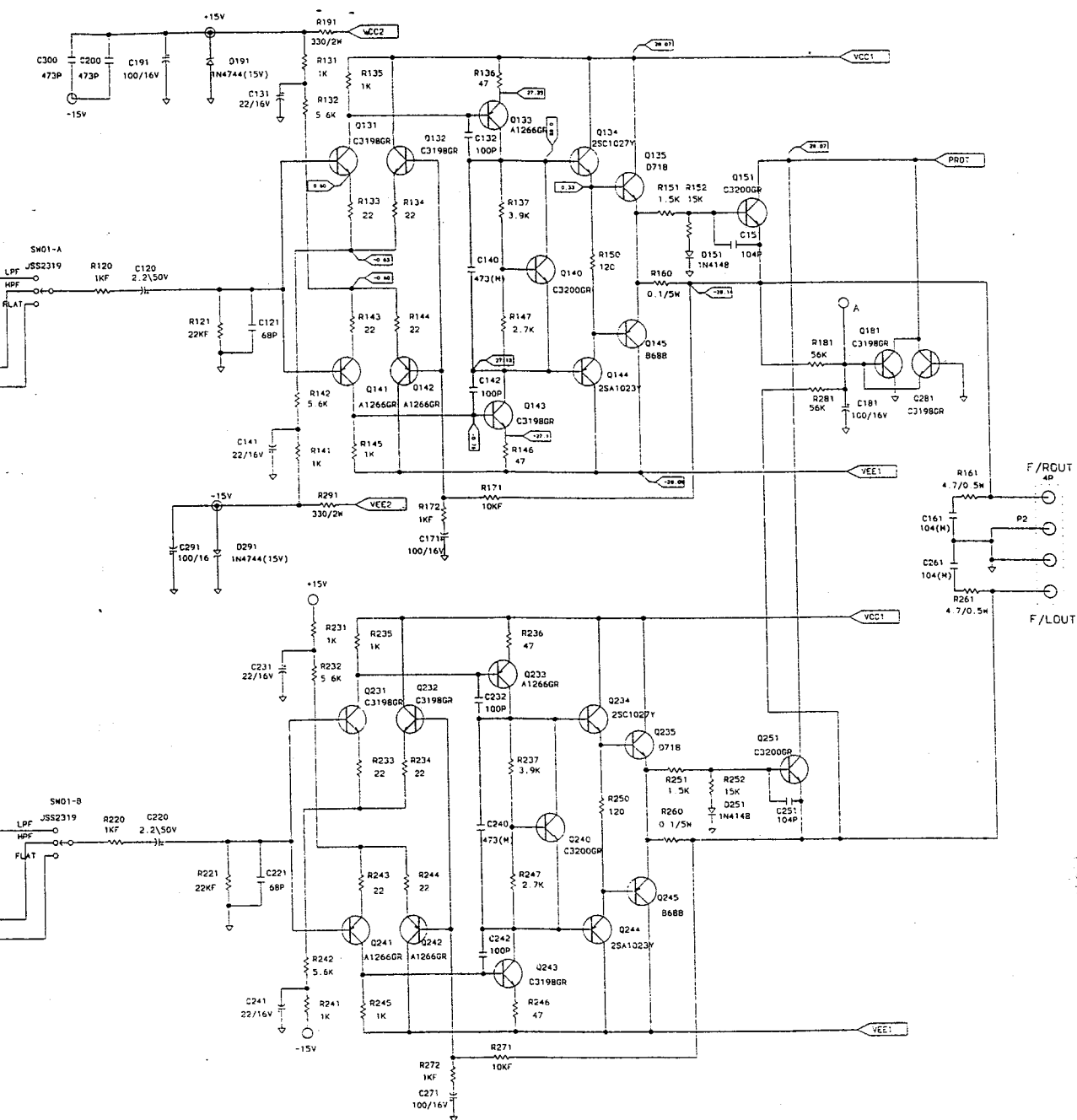


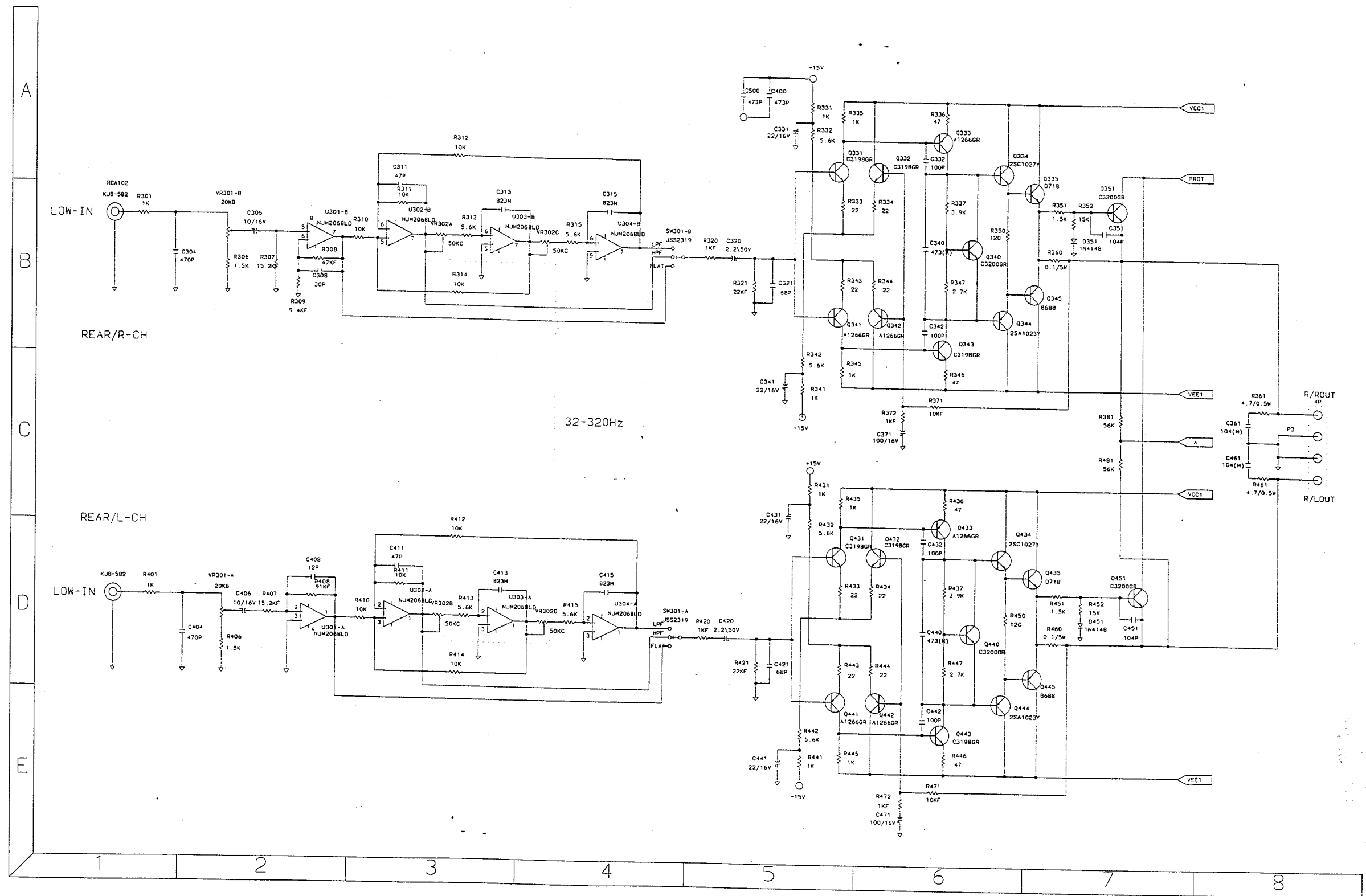
	NOMENCLATURE	MFR PARTS	Q'TY
①	HEAT SINK	MAHS6527920	1
②	PCB	PB011337010	1
③	T.R. BRACKET	MABR0341240	1
④	T.R.-BKT CUSHION	MOCU0241270	2
⑤	RUBBER CUSHION	MOCU0141330	1
⑥	FUSE HOLDER	FH015543000	8
⑦	SCREW	MNSC0034016	1
⑧	GND WIRE	WI022000600	1
⑨	SCREW	MNSC0423005	1

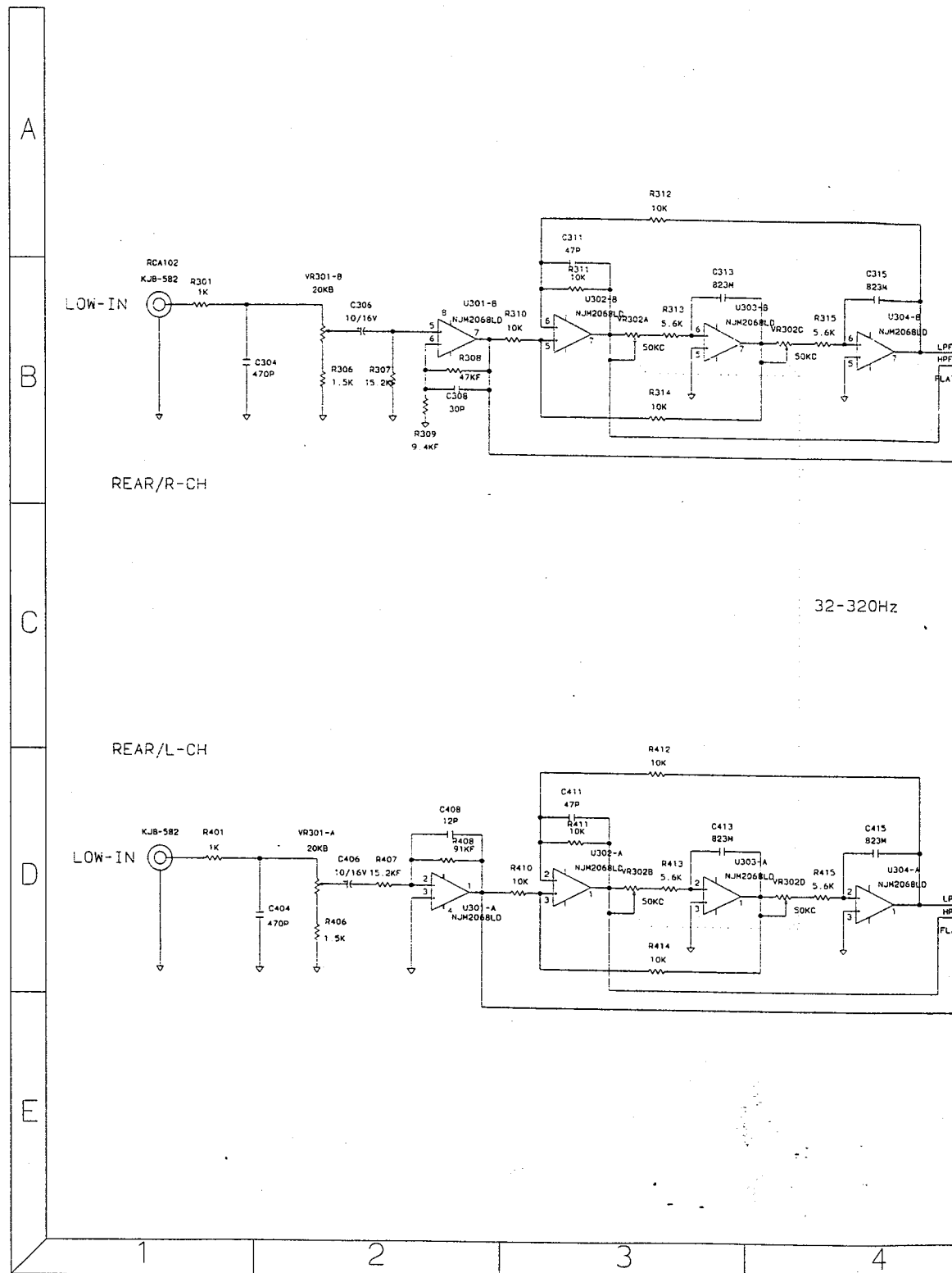
	NOMENCLATURE	MFR PARTS	Q'TY
⑩	FRONT PANEL	MAFP6537731	1
⑪	SCREW	MBSC0423006	4
⑫	SCREW	MBSC0423008	2
⑬	REAR PANEL	MAFP6537741	1
⑭	SCREW	MBSC0423006	4
⑮	SCREW	MBSC0423008	3
⑯	FUSE	FU030120301	2
⑰	BOTTOM COVER	MABC6527890	1
⑱	SCREW	MBSC0433006	6

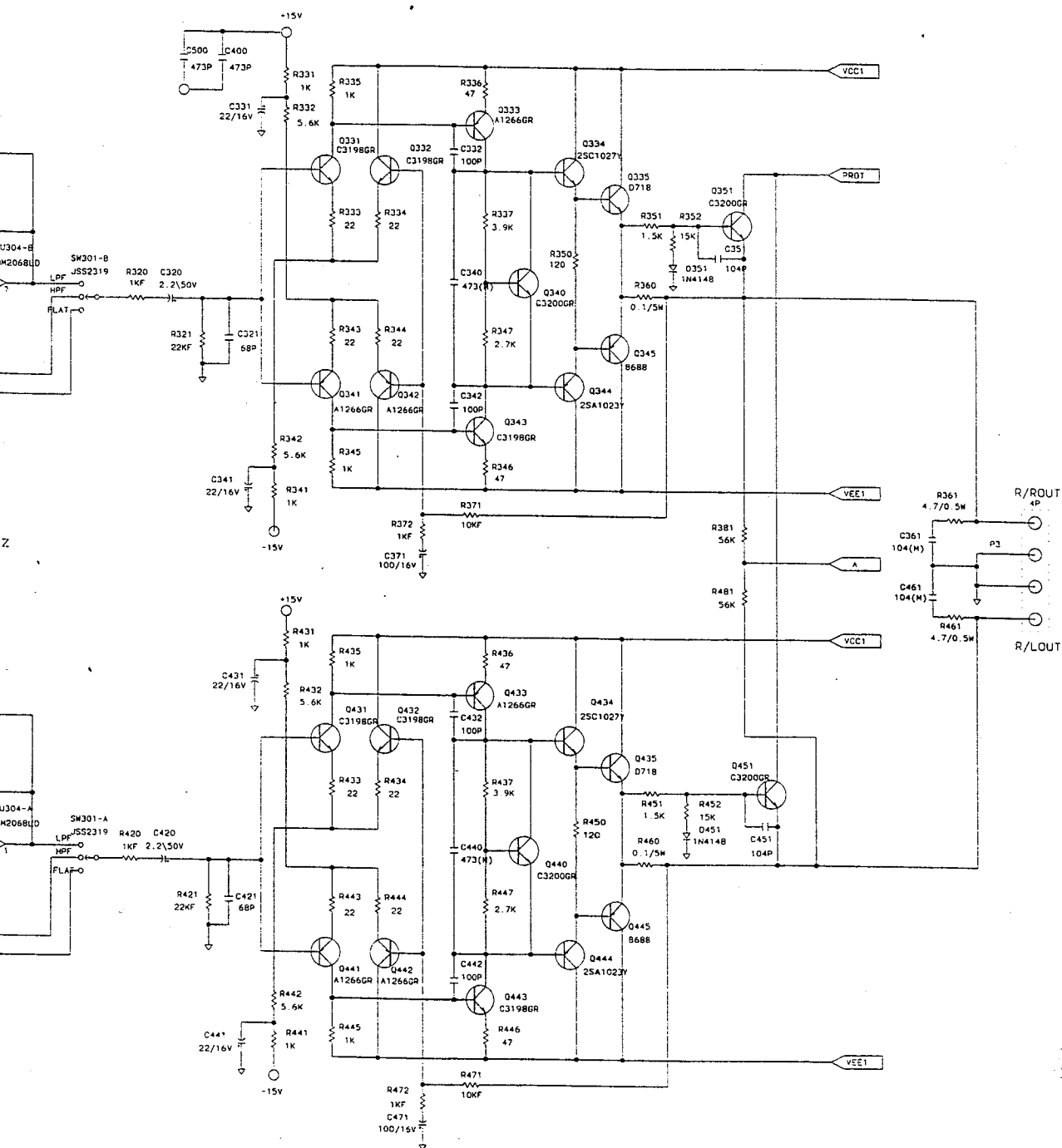










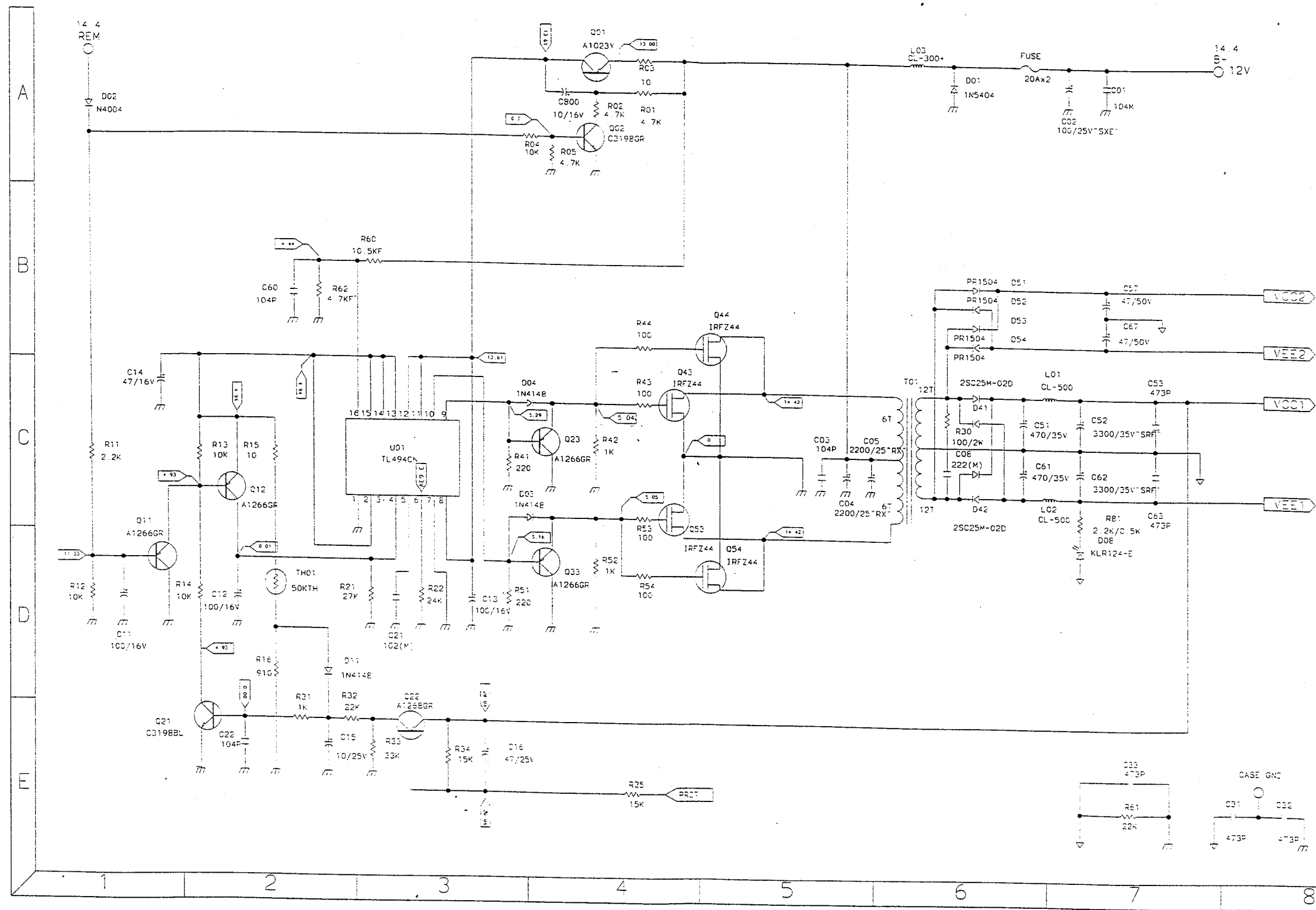


5

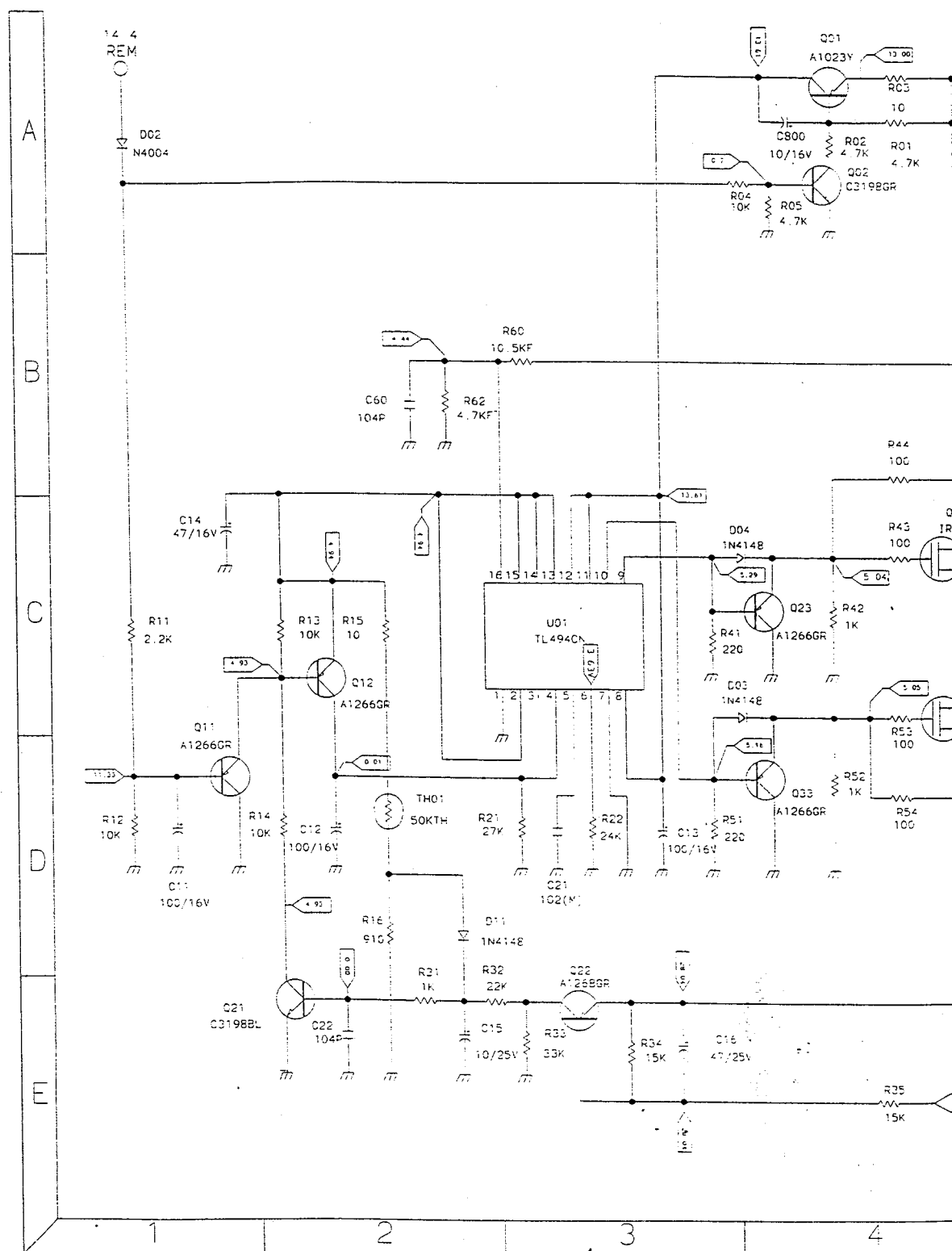
6

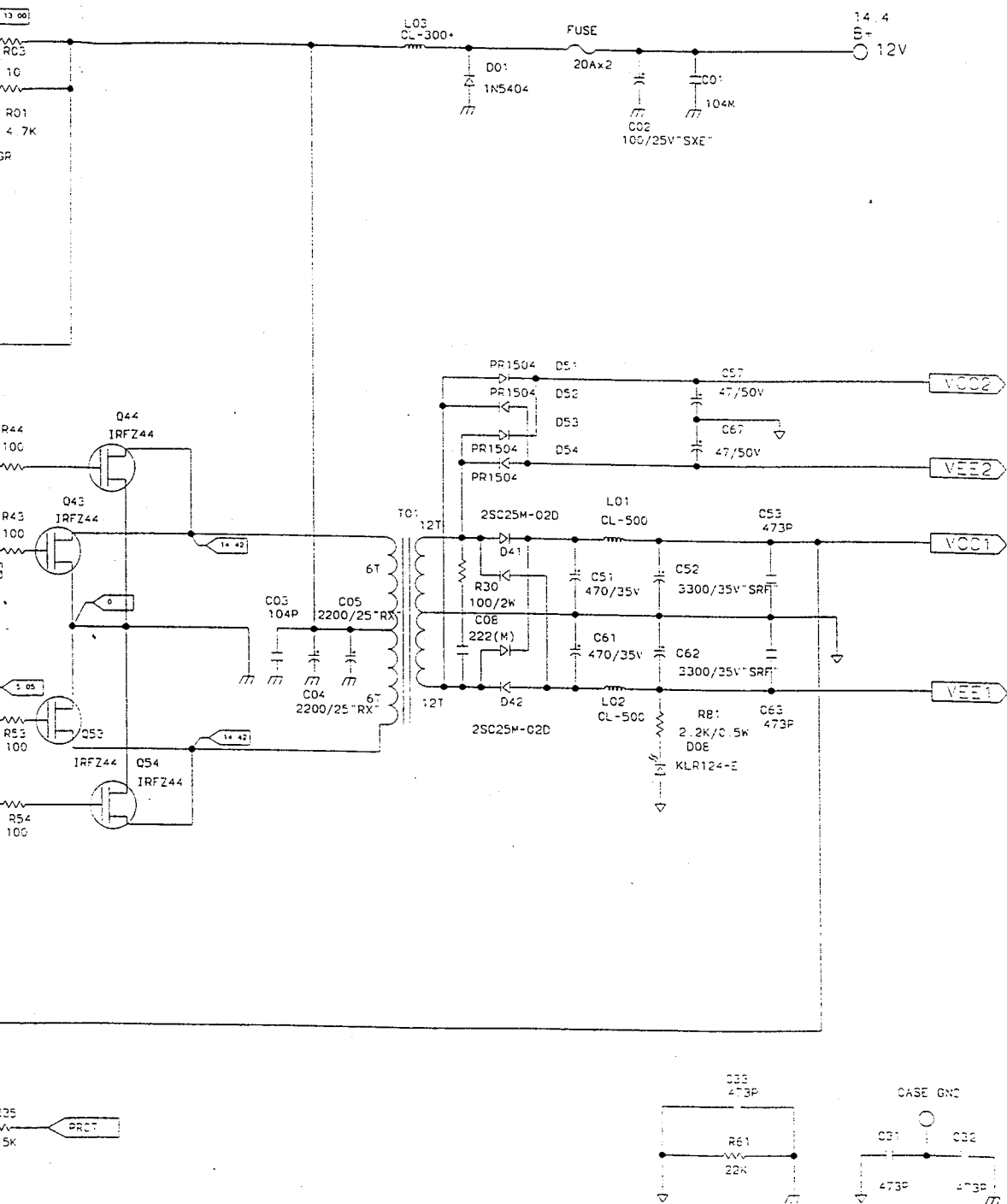
7

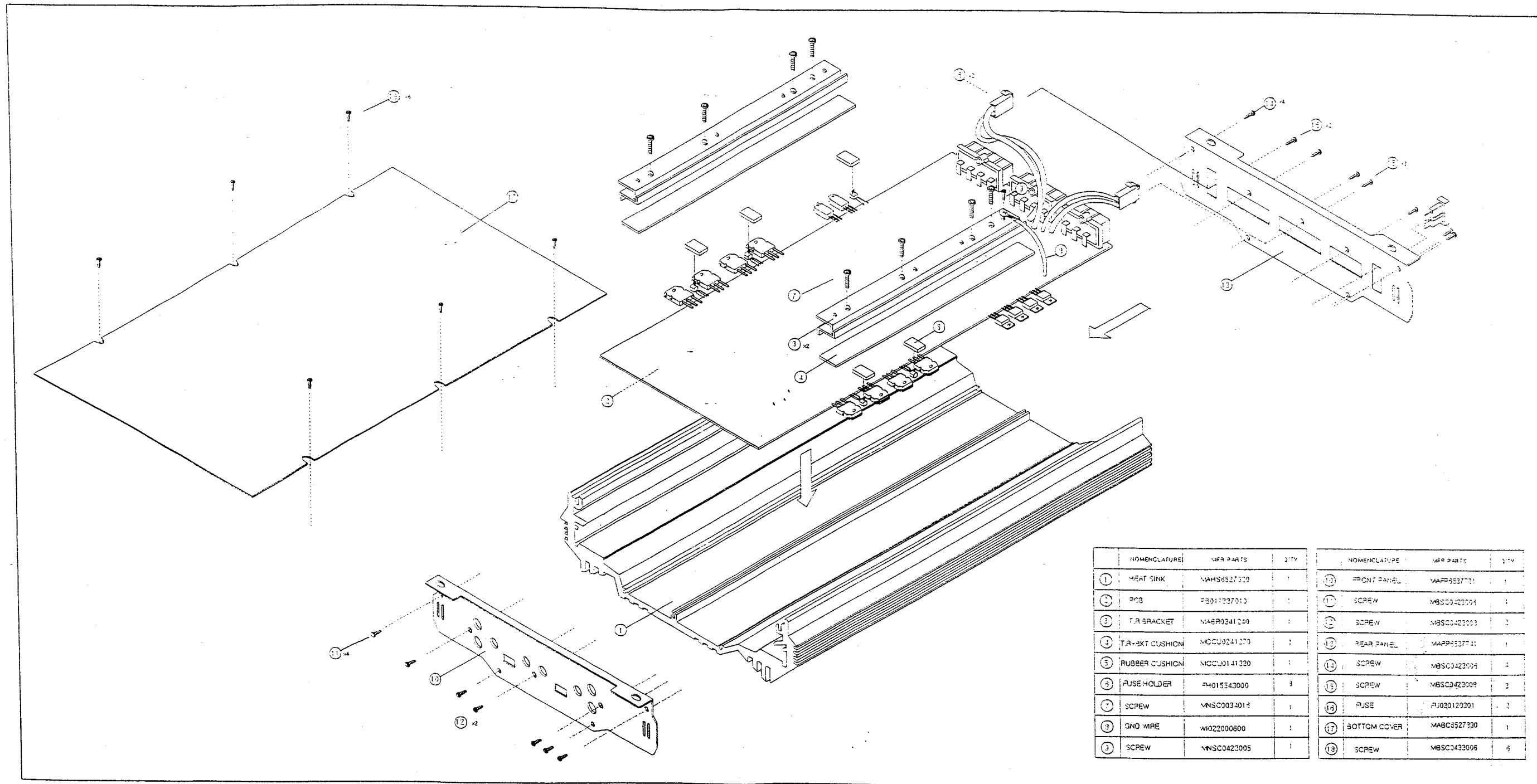
8

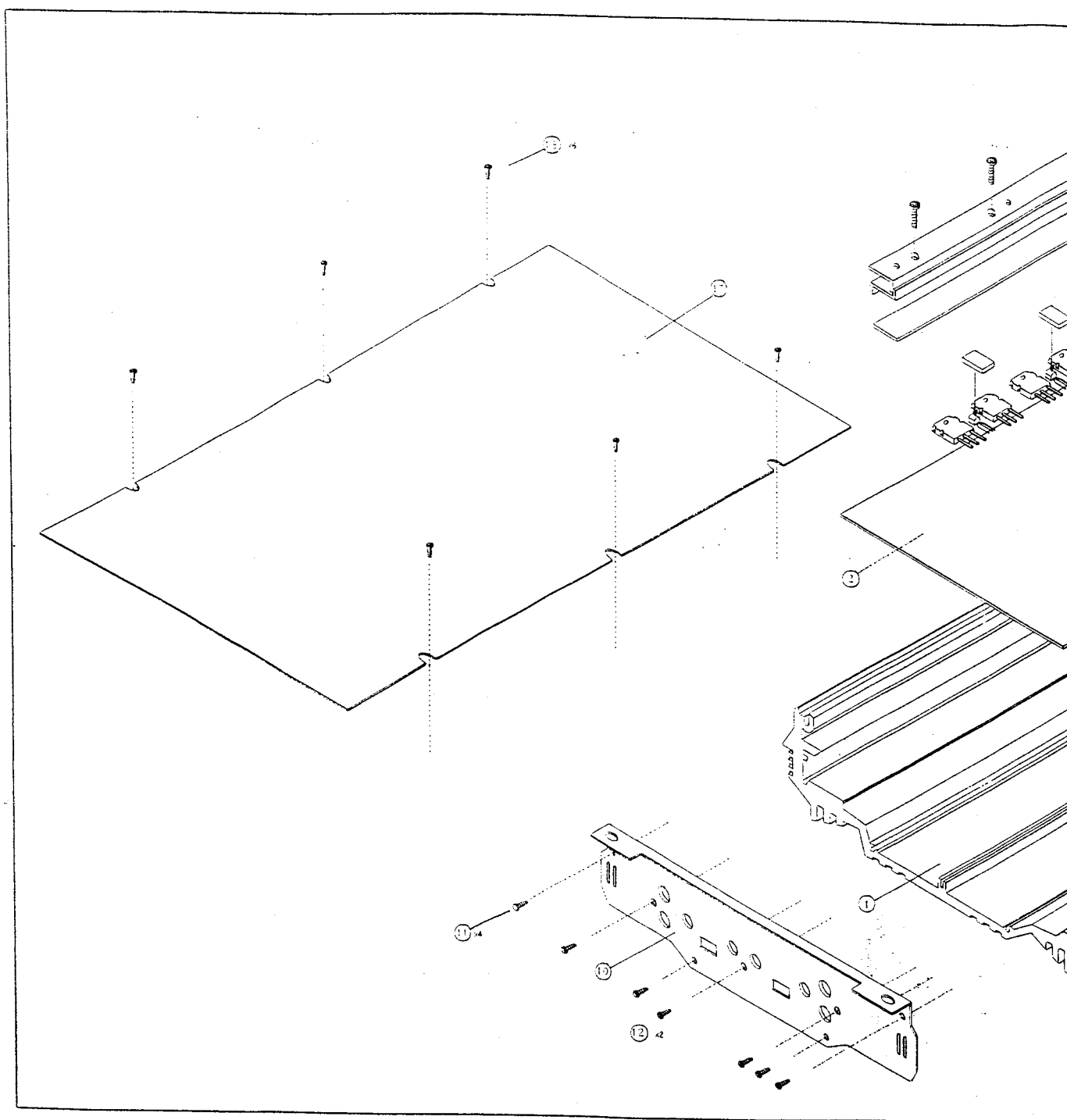


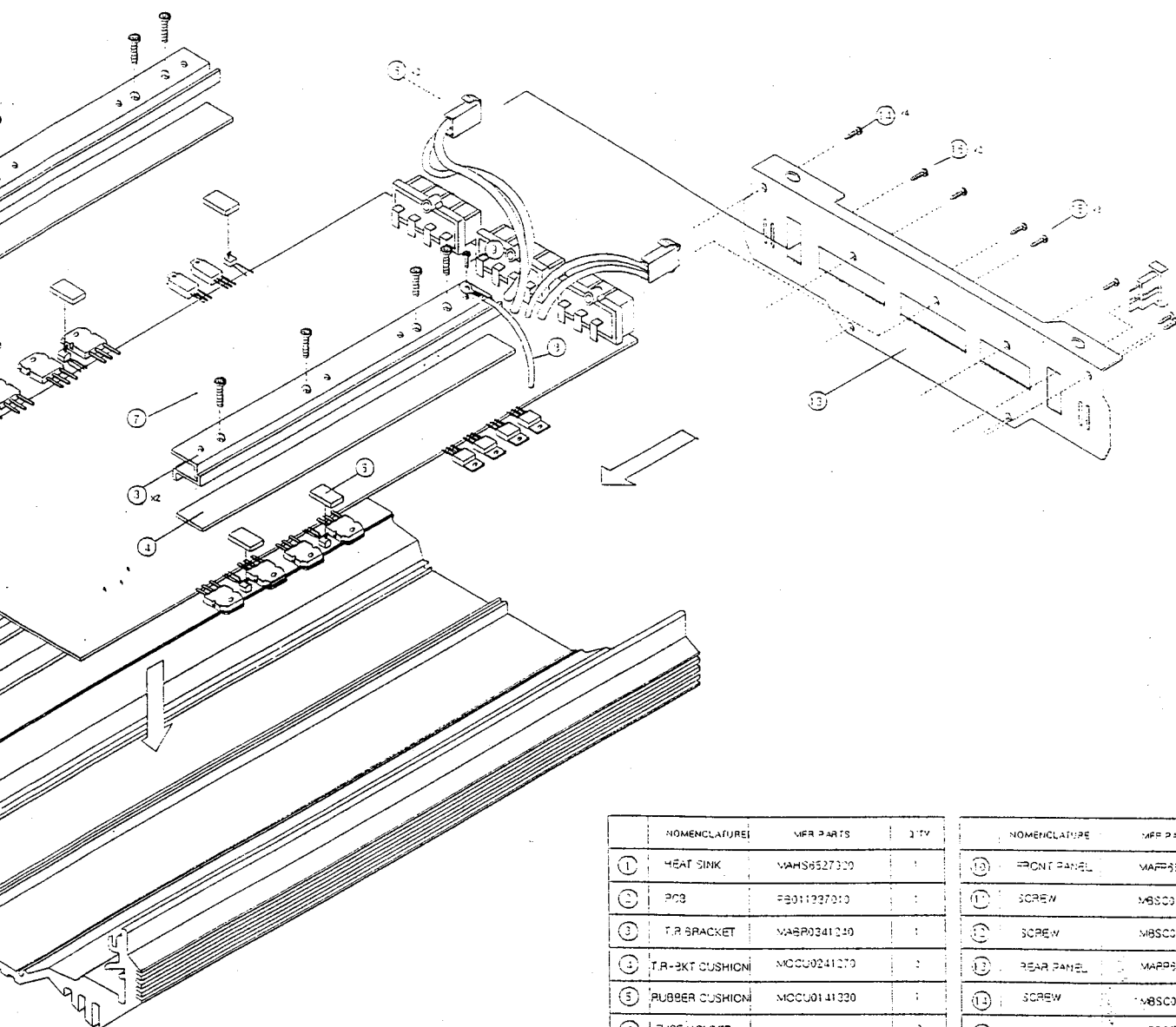












	NOMENCLATURE	MFR PARTS	QTY		NOMENCLATURE	MFR PARTS	QTY
①	HEAT SINK	MAHS6527300	1	⑩	FRONT PANEL	MAFP6537701	1
②	PCB	FB011227010	1	⑪	SCREW	MBSC0423004	1
③	T.R. BRACKET	MAEP0341040	1	⑫	SCREW	MBSC0423003	2
④	T.R. EXT. CUSHION	MOCU0241070	1	⑬	REAR PANEL	MAFP6537741	1
⑤	RUBBER CUSHION	MOCU0141030	1	⑭	SCREW	MBSC0423004	1
⑥	FUSE HOLDER	PH015543000	3	⑮	SCREW	MBSC0423003	3
⑦	SCREW	MBSC0034015	1	⑯	FUSE	FJ030120301	2
⑧	GND WIRE	WI022000600	1	⑰	BOTTOM COVER	MABC6527300	1
⑨	SCREW	MBSC0423005	1	⑱	SCREW	MBSC0433006	6